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Initial Operation & Evaluation Plan (IOEP) of ADEOS-II Mission Operations System (for NASDA External Agencies)

Ver. 1.0

rev.A

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NASDA

NATIONAL SPACE DEVELOPMENT AGENCY OF JAPAN

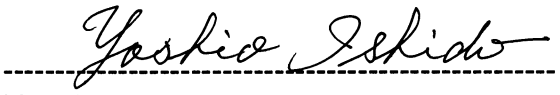
Initial Operation Evaluation Plan of ADEOS-II Mission Operations System
(for NASDA External Agencies)

List of Valid Pages

Pages	Revision
i ~ iii	N/A
iv	A
v ~ viii	N/A
1 ~ 12	N/A
13, 14	A
15, 16	N/A
17 ~ 19	A
20 ~ 29	N/A
30, 31	A
32	N/A
A1-1	N/A
A2-1, A2-2	A
A2-3 ~ A2-5	N/A
A3-1	A
A4-1~A4-3	N/A
A5-1~A5-3	N/A
A6-1~A6-3	N/A

Initial Operation Evaluation Plan of ADEOS-II Mission Operations System (for NASDA External Agencies)

Approved by:



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Initial Operation Evaluation Plan of ADEOS-II Mission Operations System (for NASDA External Agencies)

Revision History

Version	Revision	Date	Page	Contents	Note
Draft	N/A	Aug. 2001			First Draft
Draft 0.1	N/A	Sep. 2001	3	Delete description of AMSR/GLI NRT product delivery during IO&E phase 1.	
			4, 6, 7, 9	Bus Inst. C/O phase and Mission Inst. C/O phase are merged.	According to the result of MOM between NASDA and NASA/NOAA.
			6, 9	6 Mbps data recording at overseas stations. (and shipping to EOC)	
			14	MOIF I/F to NOAA during Sys-1 and Sys-2.	
			2, 4, A3-1	"ADEOS-II Contact Points Document" is added as a reference document. (App. 3 is deleted.)	
Draft 0.2	N/A	Jan. 2002	4 ~ 6	List of the related documents is updated.	
			8	Descriptions for Pre-launch Final Preparation Phase are deleted.	
			8 ~ 21	All of descriptions for Initial Operation and Evaluation Phase 1 are replaced.	
Draft 0.3	N/A	July 2002		Document number is reformed.	
			1, 2, 3, 9 ~ 11	NIPR is added to participant of Data Acquisition Test.	
			2	GSOP is added to the list of related documents.	
			3, 4	Descriptions about definition of "Operation Phase" are modified.	
			4	Descriptions about "Document Change Control" are modified.	
			5	Descriptions about "Contact Points" are modified.	
			6, 8, 9	VMS/DMS Data Acquisition at Kiruna	
				- Rehearsal is cancelled	
				- DMS data processing is added.	
			9 ~ 11	Data Acquisition & L0 Processing Test	
				- SeaWinds L0 data is processed from MRT.	
				- Data transmission pattern is specified.	
			11 ~ 14	Instrument C/O	
				- SeaWinds L0 data is processed from MRT at EOC.	
				- SeaWinds L0 and related MOIFs are provided to NOAA.	
				- Descriptions about "DCS Downlink/ Uplink Messaging Operation" are separated to new section.	
			15 ~ 18	Sys-1 & Sys-2	
				- SeaWinds Met data processing at NOAA	
				- Mean orbit data delivery from TACC	
			21	File delivery rules of Orbit Data and Time Difference Information are specified.	
			22	Procedure for urgent re-scheduling is specified in "GSOP"	
			22	Descriptions about command operation are added.	
			22, 23	Descriptions about media shipment (Raw data and POLDER L0) are added.	
			24	Initial operation and evaluation plan for mode 1 is specified.	
			App-3	Satellite checkout schedule is updated.	
Draft 0.4	N/A	Oct. 2002	2, 3	"HK Data Distribution Schedule" were added to the list of applicable documents, as ADEOS-II Project lead document.	
			6, 12	During Instrument C/O Phase, GLI 250m data acquisition is not required to NASA stations.	EOC and Kiruna are used.
			6, A2-1	Problem Report Format was prepared.	
			7	Data acquisition pattern was specified for VMS/DMS data receiving at Kiruna station on launch day.	

Version	Revision	Date	Page	Contents	Note
			7, 9	For link budget evaluation at overseas ground stations, measurement items and conditions were specified.	
			8, 10, 13, 18	OPLN file is provided to overseas ground stations during C/O phase.	
			8	For VMS/DMS data acquisition on launch day, SHAQ and LV0P were provided by using e-mail.	
			11	Detailed schedule for Instrument C/O were added.	
			11, App-4, App-5	Data acquisition pattern was specified for instrument C/O data receiving at overseas ground stations.	
			13, 14, 25	HL TLM data distribution scheme was specified.	
			14, 15	Implementation plan of DCS Downlink/Uplink Messaging Operation was corrected.	According to comments from CNES.
			15, App-3	C/O schedule was updated.	
			15	Data acquisition pattern was specified for Sys-1, Sys-2 data receiving at overseas ground stations.	
			19 ~21	Pass assignment procedure was defined.	
			App 4 ~ 6	- Format to inform nominal pattern of MDR and GLI 250m was specified.	
			App 2	- Formats of weekly and daily support request were prepared.	Based on the proposal from NASA/NGN
			21, 22	Due date of MOIF sending was specified for OPLN, SHAQ, LV0P and RTIG.	
			23, 24	Special case of MOIF exchange between EOC and Kiruna for VMS/DMS data acquisition was specified.	
			27	Descriptions about Initial Operation and Evaluation phase 2 and 3 were added.	
1.0	N/A	Nov. 2002	1	"DSMC" was added, as a facility of the ADEOS-II Mission Operation System.	
			3, 4, 5, 6, 17, 18, 19	TBDs were added to descriptions about delivery of AMSR L1A, GLI L1A and SeaWinds Met.	
			5, 6, 8, 9, 10, 11, 12,	DMS level 0 data is processed from MRT data, when MDR does not operate continuously.	
			6, 11, 12	At ASF and Kiruna, SeaWinds and DMS level 0 data processing from MRT is needed.	on 2 days in the period from L+53 to 55.
			6	Due date of result report and problem report was specified.	
			7	For VMS/DMS data acquisition at Kiruna station on the launch day, S-band data is transmitted for tracking.	
			8	For VMS/DMS data acquisition at Kiruna station, Fax is also used to send EL information as backup.	
			10, 14, 19	OPLN is not be provided to NASA stations until Sys-2 operation.	
			10, 24	RDRM/SRRM is used for raw data shipment during the instrument C/O phase.	for X1-band data.
			10, 14, 19	RERB is also prepared at NASA stations and Kiruna station.	
			10	OPLN is provided to SeaPAC for L+32 days.	
			11, App-5	ASF is used to acquire GLI C/O data.	
			12	During Instrument C/O phase, ASF, WFF and Kiruna station will record “MRT” data onto D1 cassette and will ship it to EOC.	
			13	Descriptions about quick delivery of POLDER C/O image data were added.	
			14, 19, 25	STAD is provided to all related agencies to inform orbit maneuver plan.	
			14, 25	Mean orbit data delivery is started around L+30days.	
			15	Evaluation items for DCS Downlink/Uplink Messaging Operation were specified.	TBD was closed.
			16, A3-1	Schedule of Sys-2 was changed	
			16	Restrictions of GLI level 0 data usage within NASA/NOAA were described.	
			17	Descriptions about quick delivery of POLDER level 0 data during Sys-1 were added.	

Version	Revision	Date	Page	Contents	Note
			24	Descriptions about RERC for X3-band data acquisition were added.	
			24	Delivery of TD file is started from L+27 days.	
			25	Delivery of ORST file is started from L+34 days.	
			27, A2-4	Media shipment logistics for X3-band data were specified.	
			27, 28, A3-1	Raw data media shipment frequency was clarified.	
			31, 32	MDR data and MRT data is acquired during IOCS C/O period, and processed to level 0 data.	
			A3-1	C/O schedule was updated.	Launch date: Dec. 14
			App 4 ~ 6	Nominal operation pattern of MDR and GLI 250m was fixed.	
				The other changes	According to the comments from NASA and NOAA
1.0	A	Nov. 2002	13, 14, 17~19, 30, 31	Processed DMS data is delivered to SeaPAC and CNES/POLDER.	
			A2-1, A2-2	Format of the problem report was modified.	
			A3-1	Media shipment schedule was updated.	

Note: Modifications made to this document are annotated as follows:

- Deletions are indicated by (e.g., ~~Project~~)
- Additions are indicated by under bar (e.g., <u>Project</u>)
- Comments are indicated by italics (e.g., *Project*)

Initial Operation Evaluation Plan of ADEOS-II Mission Operations System (for NASDA External Agencies)

List of TBDs

No.	Remained TBD	Related Pages	Related Agencies	Due Date
1	Products delivery plan for AMSR level 1A, GLI level 1A and SeaWinds Met Data.	3, 4, 5, 6, 17, 18, 19	NASDA, PO.DAAC, JPL and NOAA	L+ 1 month

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Appendix

Initial Operation Evaluation Plan of ADEOS-II Mission Operations System (for NASDA External Agencies)

List of Figures and Tables

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1 Purpose

This document is a baseline document to specify the tasks and evaluation items for the initial checkout of ADEOS-II Mission Operations System to confirm completion of readiness for routine operation start.

2 Scope

2.1 Target Systems

(a) ADEOS-II Mission Operations System

ADEOS-II Mission Operations System consists of the following systems.

- ADEOS-II Data Acquisition and Processing System @ NASDA/EOC
  - ✓ X band Receiving System
  - ✓ Feeder link Station
  - ✓ MMO
  - ✓ Recording Subsystem
  - ✓ Processing Subsystem (AMSR/DCS, GLI)
  - ✓ DCS Equipment (Master Beacon, NASDA/DCP)
- Earth Observation Data and Information System (EOIS) @NASDA/EOC
- Overseas Ground Stations
  - ✓ NASA Stations (ASF, WFF and DSMC)
  - ✓ Kiruna Station
- Foreign Ground Stations
  - ✓ NIPR (Showa base in Antarctica)
- Other Related Systems/Agencies
  - ✓ TACC @NASDA/TKSC
  - ✓ Sensor Providers (JPL (SeaPAC), CNES (POLDER, DCS), NIES and TKSC/TEDA)
  - ✓ Data Utilization Agency (PO.DAAC, NOAA)

(b) Others

The following organizations of NASDA are related to the initial operation and evaluation of ADEOS-II Mission Operation System.

- ADEOS-II Project (Satellite team)
- TACC

2.2 Scope of This Document

The scope of this document is shown in below.

(a) Evaluation of ADEOS-II Mission Operations System

Operation requirements during the period of initial operation phase, such as parameter optimization and algorithm evaluation, are specified for ADEOS-II Mission Operations System.

(b) Support of ADEOS-II Spacecraft Checkout on Orbit

Operation requirements are specified for ADEOS-II Mission Operations System to support ADEOS-II Spacecraft Checkout on orbit.

(c) Related Documents, Organization and Master Schedule

Related documents, organization and master schedule are specified for initial checkout operation of ADEOS-II Mission Operations System.

3 Related Documents

3.1 Applicable Documents

Applicable documents of this IOEP are listed in below.

(a) Initial Operation Evaluation Documents

(1) Initial Operation Evaluation Comprehensive Plan of ADEOS-II Mission Operations System, NEB-01021 (in Japanese)

(b) Interface Documents between NASDA and Related Agencies

(2) ADEOS-II Mission Operations Implementation Plan (MOIP)
- (2-1) NASDA/NASA/NOAA, AD2-EOC-96-055
- (2-2) NASDA/CNES POLDER, AD2-EOC-95-011
- (2-3) NASDA/CNES Argos, AD2-EOC-95-010
- (2-4) NASDA/EA, AD2-EOC-95-016
- (2-5) NASDA/Kiruna Station, AD2-EOC-95-016

(3) ADEOS-II to Ground Stations Interface Document (AGSID), AD2-EOC-96-123

(4) ADEOS-II Mission Operations Interface Specification (MOIS)
- (4-1) Common Part, AD2-EOC-96-054
- (4-2) NASDA/NASA/NOAA, AD2-EOC-97-046
- (4-3) NASDA/CNES POLDER, AD2-EOC-98-015
- (4-4) NASDA/CNES Argos, AD2-EOC-97-040
- (4-5) NASDA/NIES, AD2-EOC-97-047
- (4-6) TKSC/TEDA, NEB-99012
- (4-7) NASDA/Kiruna Station, AD2-EOSD-97-102

(5) ADEOS-II Mission Operations Interface Control Document (MOICD) (NASDA/NIPR), AD2-EOSD-01-097

(6) Ground System Operations Procedure (GSOP) for ADEOS-II Mission Operation

(c) ADEOS-II Project Lead Document

(7) Satellite Orbital Checkout Procedure (SOCP), ADII-M-R-99010

(8) HK Data Distribution Schedule
- (8-1) for ILAS-II, NBE-020031 (in Japanese)
- (8-2) for SeaWinds, NBE-020032
- (8-3) for POLDER, NBE-020033
- (8-4) for DCS, NBE-020034

3.2 Reference Documents

Reference documents of this IOEP are listed in below.

(9) ADEOS-II Operation Training Plan, AD2-EOSD-01-108

(10) ADEOS-II Contact Points Document, AD2-EOC-96-124

3.3 Lower Document

The following document is prepared based on this IOEP.

(11) Initial Operation Evaluation Procedure of ADEOS-II Mission Operations System

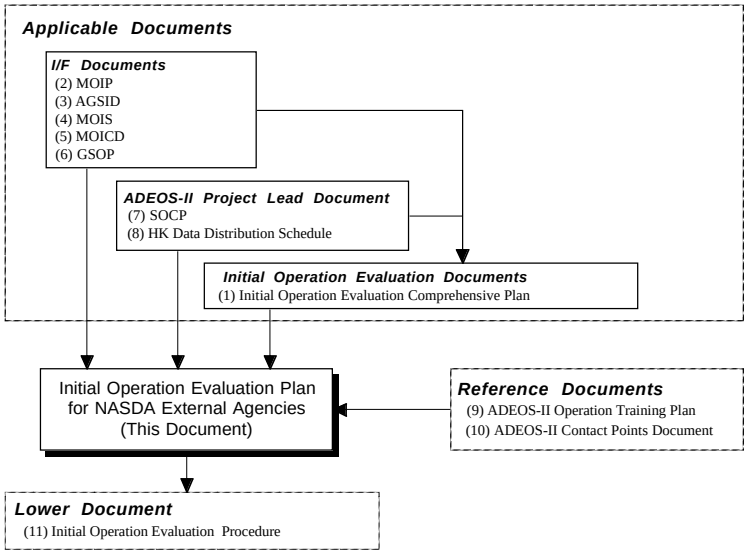


Fig. 3-1 Related Documents

4 Operation Phase

Operation of ADEOS-II Mission Operations System will be enhanced gradually in accordance with the phases defined as follows.

4.1 Pre-launch Final Preparatory Phase

This phase covers the period from completion of system development (i.e. completion of Mission Simulation Test) to ADEOS-II launch. (Launch - 4 months ~ Launch, as target)

4.2 Initial Operation and Evaluation Phase 1

Final goal of this phase is to start routine operation of global data acquisition, and level 0 data delivery to the related agencies. In order to attain this target, initial checkout of ADEOS-II spacecraft and Mission Operations System will be performed, and system parameters will be tuned up during this phase.
This phase corresponds to the Initial Checkout Phase. ADEOS-II Project office calls it spacecraft operation phase.

4.3 Initial Operation and Evaluation Phase 2

During this phase, product processing system at each agency will be evaluated and tuned up, and level 1 and/or higher level products will be calibrated and validated. By the end of this phase, routine delivery of level 1 and/or higher level products to the specific users, such as PIs, will be started. Moreover, AMSR level 1A NRT product delivery from NASDA to PO.DAAC and GLI 1km level 1A NRT product delivery from NASDA to NOAA is started during this phase (TBD).

4.4 Initial Operation and Evaluation Phase 3

Continuing from phase 2, product processing system at each agency will be evaluated and tuned up, and level 1 and/or higher level products will be calibrated and validated during this phase. By the end of this phase, routine delivery of level 1 and/or higher level products to the general users will be started.

4.5 Full System Routine Operation Phase

In this phase, ADEOS-II Mission Operations System will fully operate and will provide all services, including global data acquisition, level 0 data processing/delivery, and product (NRT, level 1 and higher level) processing/delivery. Additionally, re-processing of product will be carried out due to algorithm update, as needed.

Major activities in each phase are summarized in table 4-1, as the definition of operation phase.

Table 4-1 Definition of Operation Phase

Major Activities		Phase 1	Phase 2	Phase 3	Routine
Space Segment	Bus instruments	E	R	R	R
	Mission instruments	E	R	R	R
Ground Segment	Mission operation planning	E	R	R	R
	Data receiving & recording	E	R	R	R
	Level 0 data processing & delivery to the related agencies	E	R	R	R
	Level 1 and/or higher level product processing & delivery to the specific users.	E	E	R	R
	NRT data processing & delivery to the related agencies	E	E	R (TBD)	R
	Level 1 and/or higher level product processing & delivery to the general users.	E	E	E	R

E: Evaluation Operation R: Routine Operation

5 Configuration Control

5.1 Change Control

Changes of this document shall be controlled by NASDA/EORC. If it is necessary to change the contents of this document, NASDA and the related agencies will make coordination about the change. And then, NASDA will revise this document immediately according to the result of coordination, and distribute the updated document to all related agencies.

5.2 Contact Points

Responsibility for evaluation operation and routine operation is specified as follows.

(a) Space Segment

- Evaluation Operation : Development team
- Routine Operation : Operation team

(b) Ground Segment

- Evaluation Operation : Development team with Operation team support
- Routine Operation : Operation Team

Contact points of Development team and Operation team at NASDA and related agencies are listed in the “ADEOS-II Contact Points Document”, AD2-EOC-96-124.

6 Operation Requirements

6.1 Pre-launch Final Preparatory Phase

Operation training is performed during this phase to confirm that every systems of ADEOS-II Mission Operations System are ready to carry out initial operation after launch.
The detailed plan of operation training is specified in the "ADEOS-II Operation Training Plan", AD2-EOSD-01-108.

6.2 Initial Operation and Evaluation Phase 1

The purpose of operation during this phase is to support ADEOS-II spacecraft checkout on orbit, and to evaluate function and performance of ADEOS-II Mission Operations System to start global data acquisition, and level 0 data and AMSR/GLI NRT products (TBD) delivery at the end of this phase.
NASDA and all related agencies support of the ADEOS-II initial checkout phase will be conducted on a best effort basis. This encompasses acquisition of spacecraft downlink as well as processing and delivering data products and files. These activities will assist NASDA and all related agencies in verifying their system's performance in preparation for routine operation support to begin at launch + 4 months.
In this phase, mission operation plan of ADEOS-II including bus and mission instruments will be generated by ADEOS-II Project (satellite team), except for System Total 2 (Sys-2).

6.2.1 Overview

In this phase, the following operations are carried out.

(a) VMS/DMS Data Acquisition at Kiruna station

VMS and DMS data is acquired at Kiruna station via X3-band, for monitoring of deployment of solar array paddle and IOCS and orbit maneuver. The VMS and DMS data is processed to level 0 data, and delivered to EOC.

(b) Data Acquisition and Level 0 Processing Test at Ground Stations

60 Mbps PN code, MDR data (60 Mbps PN code or TF data[*1])) and MRT data (TF data[*1]) is acquired at ground stations by using X1-band and X3-band, to confirm data receiving and recording function at EOC, Kiruna station, ASF and WFF.
MDR data and MRT data of TF data[*1] is processed to level 0 data to confirm level 0 data processing function at EOC, Kiruna station, ASF and WFF.

*1: Transfer Frame data (It consists of HK source packet data and DMS data during this test. Moreover, SeaWinds ROM data is included in TF data after SeaWinds mode is shifted from Thermal safe to ROM.)

(c) Instrument Checkout

Checkout of each mission instrument on ADEOS-II is performed. The checkout data is acquired at EOC, Kiruna station, ASF and WFF, is processed to level 0 data and HK TLM data, and is delivered to sensor providers. Moreover, the level 0 data will also be delivered to the other related agencies, if needed by the agency and agreed by the concerned sensor provider.

Especially for DCS instrument checkout, Downlink/Uplink Message is exchanged between Master Beacon, DCS instrument on ADEOS-II and Data Collection Platform using UHF, to confirm the frequency characteristics.

HK TLM data of each mission instrument is processed by TACC also, and delivered to sensor providers via network.

Table 6.2-1 C/O Data Receiving, Processing and Distribution

Station	Band	Data Processing										
		ILAS-II	POLDER	SeaWinds	DCS	TEDA	GLI 1km	GLI 250m	AMSR	VMS	DMS	HK TLM
EOC	X1	*1	*2	*1	*1	*1	*4	*4	*4	*4	*4	*6
	X3	*1		*1	*1							
Kiruna	X1		*3	*1	*1	*1	*3	*3	*1	*1	*1	*5
	X3			*1	*1						*1	
ASF	X1		*3	*1	*1	*1	*3		*1	*1	*1	*5
	X3			*1	*1						*1	
WFF	X1		*3	*1	*1	*1	*3		*1	*1	*1	*5
	X3				*1							

*1: Level 0 data is processed from MDR or MRT data, and is distributed to sensor provider via network
(For SeaWinds and DMS, MRT data is processed to level 0 data at EOC, Kiruna station and ASF, when MDR does not operate continuously.)
*2: Level 0 data is processed from MDR data, and is distributed to sensor provider by D1 cassette.
*3: Raw data of MDR or GLI 250m data is recorded on D1 cassette, and is shipped to EOC
*4: The data is processed for evaluation within NASDA (No distribution).
*5: HK Source Packet data is processed from MDR data, and is distributed to EOC and SeaPAC.
*6: HK Source Packet data is processed from MDR data, and is distributed to SeaPAC. HK TLM data is processed from the HK Source Packet data, including receipt data from Kiruna station, ASF and WFF, and is distributed to sensor providers, except for SeaPAC.

(d) System Total 1 & 2

All of bus and mission instruments on ADEOS-II operate by automatic command from OBC (On Board Computer) in the same pattern as routine operation.

The mission data is acquired at EOC, Kiruna station, ASF and WFF, is processed to level 0 data, HK TLM data (including HK Source Packet data) and NRT (Near Real Time) products (TBD), and is delivered to the related agencies by using the same method as routine operation.

For the System Total 1, operation commands of mission instruments are planned and generated by ADEOS-II Project, in accordance with the mutual agreement between NASDA and sensor providers specified in the SOCP.

For the System Total 2, operations of mission instruments are requested by sensor providers using REQQ file.

6.2.2 Reporting Method

- NASDA prepares procedures necessary to perform operations in this phase, and provides them to the related agencies as the document “Initial Operation and Evaluation Procedure of ADEOS-II Mission Operations System”.
- Related agencies perform operation in accordance with the procedure, fill the result in the procedure sheets, and provide them to NASDA as the result report. To the report to NASDA, the related agencies attach necessary engineering data (such as RF characteristics information), when NASDA requires it as background data for operation evaluation.
- If an anomaly is found during operation, the related agencies report the problem to NASDA using the specified format, which is attached to this document as the Appendix-2.1.
- The result report are generated for each pass, and reports of 1 day are provided to NASDA by e-mail or Fax at the end of working time in each operation day (local time).
- When an problem occurs, problem report should be generated immediately, and provided to NASDA by e-mail and Fax as soon as possible.

6.2.3 Operation and Evaluation Plan

6.2.3.1 VMS/DMS Data Acquisition at Kiruna station

(a) Participants

- NASDA (EOC)
- Kiruna Station (SSCAS and NRPS)

(b) Schedule

Launch day

(c) Data Acquisition Pattern

Launch day (L)								L+1 day
Rev 0	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Rev 7	Rev 8
Launch					VMS/DMS Data Acquisition	Backup		

(d) Implementation Plan

a) EOC and Kiruna station prepares necessary MOIFs, and exchanges them (see 6.2.4).
b) Kiruna station receives MRT data via X3-band. Link budget of X3-band is evaluated. Simultaneously with X3-band data transmission, S-band data is transmitted from ADEOS-II for tracking.
c) Kiruna station processes the MRT data to VMS and DMS level 0 data, and distributes them to EOC via network.
d) Kiruna station records raw data of the MRT data onto D1 cassette, and ships it to EOC.

(e) Evaluation Items

EOC and Kiruna station confirms system capability and operation procedure, shown in below.

(1) Preparing, exchanging and reading MOIFs

a) Format and readability of MOIFs, and file exchange procedure is confirmed by EOC and Kiruna station.

(2) Tracking ADEOS-II, and receiving data from ADEOS-II

a) RF characteristics of X3-band are measured at Kiruna station, and link budget is evaluated.
b) Measurement Items & Conditions

Measurement Items	Target	Condition
AGC Level	X3/MRT	Time order chart in dbm unit or db unit
Spectrum Analyzer Picture	X3/MRT	Data plots of down-converted IF frequency

c) Measurement Range
   - ✓ From AOS to LOS (over 10 degrees, at least)

(3) Recording raw data onto D1 cassette

a) Successful completion of raw data recording is confirmed by Kiruna station.
b) Format and readability of raw data is confirmed by EOC.

(4) Processing level 0 data

a) Successful completion of level 0 data processing is confirmed by Kiruna station.
b) Format and readability of level 0 data (VMS, DMS level 0 data and HK source packet) is confirmed by EOC.

(5) Shipping raw data from Kiruna station to EOC

a) Media shipping procedure is confirmed by EOC and Kiruna station.
b) Media shipment delay is evaluated by EOC.

(6) Sending level 0 data from Kiruna station to EOC via network

a) Level 0 data transmission procedure is confirmed by EOC and Kiruna station.

(f) Data/File Exchange

From	To	Data/File	Media	Note
EOC	Kiruna	Pass Request	Fax/e-mail	Instead of REQR
		OPLN	e-mail	
		SHAQ	e-mail	
		LV0P	e-mail	
		EL	Network	Fax is also used as backup
Kiruna	EOC	Reply to Pass Request	Fax/e-mail	Instead of STGS
		RERC	Network	
		L0RL	Network	
		VMS L0 data	Network	
		DMS L0 data	Network	
		Raw Data	D1 cassette	MRT data

6.2.3.2 Data Acquisition and Level 0 Processing Test at Ground Stations

(a) Participants

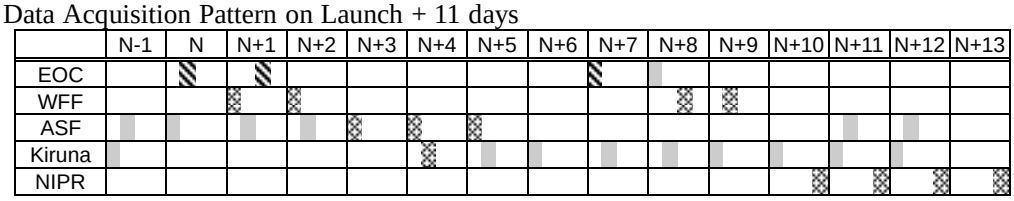
- NASDA (EOC)
- Kiruna station (SSCAS and NRPS)
- NASA stations (ASF, WFF and DSMC)
- NIPR (Showa base)
- Sensor Provider (SeaPAC)

(b) Schedule

Launch + 11 days, and 32 days

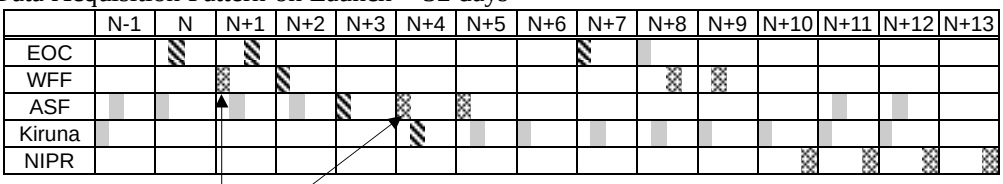
(c) Data Acquisition Pattern

(1) Data Acquisition Pattern on Launch + 11 days



No RF Transmission
X1: MDR PN 60 Mbps
X3: MRT TF data (HK Source, DMS)
X1: PN 60 Mbps
X3: MRT TF data (HK Source, DMS)

(2) Data Acquisition Pattern on Launch + 32 days



X1 transmission time is restricted within 9 minutes due to thermal restriction.

No RF Transmission
X1: MDR TF data (HK Source, SeaWinds, DMS)
X3: MRT TF data (HK Source, SeaWinds, DMS)
X1: PN 60 Mbps
X3: MRT TF data (HK Source, SeaWinds,DMS)

(d) Implementation Plan

a) EOC, NASA stations, Kiruna station and NIPR prepare necessary MOIFs, and exchange them (see 6.2.4).
b) EOC, NASA stations and Kiruna station receive MRT data (TF data) via X3-band. Link budget of X3-band is evaluated.
c) EOC, NASA stations, Kiruna station and NIPR receive 60 Mbps PN code or MDR data (60 Mbps PN code or TF data) via X1-band. Link budget of X1-band is evaluated. 60 Mbps PN code recorded on MDR is reverse data due to MDR reproducing.
d) NASA stations and Kiruna station record raw data of 60 Mbps PN code, MDR and MRT data onto D1 cassettes, and ship them to EOC. NASA stations will record MRT data only on a non interfering basis when a third HDDR is available at the station.
e) NIPR records raw data of 60 Mbps PN code onto D1 cassettes, and ship them to EOC.
f) EOC, NASA stations and Kiruna station process the TF data of MDR and MRT data to level 0 data of HK source packet, DMS and SeaWinds.
g) NASA stations and Kiruna station provide the level 0 data of DMS and HK source packet to EOC via network.
h) EOC, NASA stations and Kiruna station provide the HK source packet and the SeaWinds level 0 data to SeaPAC via network.

(e) Evaluation Items

EOC, NASA stations and Kiruna station confirm system capability and operation procedure, shown in below.

(1) Preparing, exchanging and reading MOIFs

a) Format and readability of MOIFs, and file exchange procedure is confirmed by EOC, NASA stations, Kiruna station and NIPR.

(2) Tracking ADEOS-II, and receiving data from ADEOS-II

a) RF characteristics of X1-band are measured at EOC, NASA stations, Kiruna station and NIPR, and link budget is evaluated.
b) RF characteristics of X3-band are measured at EOC, NASA stations and Kiruna station, and link budget is evaluated.
c) Measurement Items & Conditions

Measurement Items	Target		Station					Condition
			EOC	ASF	WFF	KRNS	NIPR	
AGC Level	X3	MRT	O	O	O	O		Time order chart in dbm unit or db unit
	X1	MDR/TF	O	O	O	O		
		MDR/60 Mbps PN	O					
		60 Mbps PN		O	O	O	O	
Spectrum Analyzer Picture	X3	MRT	O	O	O	O		Data plots of down-converted IF frequency
	X1	MDR/TF	O	O	O	O		
		MDR/60 Mbps PN	O					
		60 Mbps PN		O	O	O	O	
BER	X3	MRT						
	X1	MDR/TF						
		MDR/60 Mbps PN	O					Formula of PN code generation $= X^{15}+X^{14}+1$ Count interval for BER measurement $= 1 \times 10^{-8}$
		60 Mbps PN		O	O	O	O	

d) Measurement Range
   ✓ From AOS to LOS (over 10 degrees, at least)

(3) Recording raw data onto D1 cassette

a) Successful completion of raw data recording is confirmed by EOC, NASA stations, Kiruna station and NIPR.
b) Format and readability of raw data is confirmed by EOC.

(4) Processing level 0 data
a) Successful completion of level 0 data processing is confirmed by EOC, NASA stations and Kiruna station.
b) Format and readability of level 0 data (DMS and HK source packet) is confirmed by EOC.
c) Format and readability of level 0 data (SeaWinds and HK source packet) is confirmed by SeaPAC.

(5) Shipping raw data from NASA stations and Kiruna station to EOC
a) Media shipping procedure is confirmed by EOC, NASA stations, Kiruna station and NIPR.
b) Media shipment delay is evaluated by EOC. However, media shipment delay from NIPR to EOC is out of evaluation.

(6) Sending level 0 data from NASA stations and Kiruna station to EOC via network
a) Level 0 data transmission procedure is confirmed by NASA stations, Kiruna station, EOC and SeaPAC.

(f) Data/File Exchange

From	To	Data/File	Media	Note
EOC	All	EP, TD	Network	see section 6.2.4.4 (b) and (d)
	Kiruna NASA stations	Pass Request	Fax/e-mail	Instead of REQR
		OPLN	Network	for Kiruna station
		SHAQ	Network	
		LV0P	Network	For TF data of both MDR and MRT
		EL	Network	For Kiruna station
		RDRM	Network	For raw data of X1-band data
	NIPR	RDRM	Network	For raw data of X1-band data (SRRM is not provided from NIPR)
		SHAQ	Network	
	SeaPAC	OPLN	Network	for L+32 days
		HK source packet	Network	
		SeaWinds level 0 data*2	Network	
Kiruna NASA stations	EOC	Reply to Pass Request	Fax/e-mail	Instead of STGS
		RERC/RERB	Network	
		L0RL	Network	For TF data of both MDR and MRT
		SRRM	Network	For raw data of X1-band data
		HK source packet	Network	
		DMS level 0 data	Network	
		Raw Data	D1 cassette	60 Mbps PN code, MDR and MRT*1 data
	SeaPAC	HK source packet	Network	Kiruna data is relayed through EOC.
		SeaWinds level 0 data*2	Network	Kiruna data is relayed through EOC.
NIPR	EOC	RERC	Network	
		Raw Data	D1 cassette	60 Mbps PN code

*1: NASA stations will record MRT data only on a non interfering basis when a third HDDR is available at the station.
*2: SeaWinds level 0 data is processed from MRT data acquired on Launch + 32 days.

6.2.3.3 Instrument Checkout

6.2.3.3.1 Mission Instrument Checkout

(a) Participants
- NASDA (EOC, TACC)
- Kiruna station (SSCAS and NRPS)
- NASA stations (ASF, WFF and DSMC)
- Sensor Providers (JPL (SeaPAC), CNES (POLDER, DCS), NIES and TKSC/TEDA)
- Data Utilization Agency (NOAA)

(b) Schedule

Launch + 34 days ~ 70 days (See the Appendix 3 in detail for schedule of instrument checkout)

No.	Schedule	Operation	Mission Data		Station				Note
					EOC	ASF	WFF	KRNS	
1	L+34	AMSR C/O	MDR	AMSR, SeaWinds, DMS, HK	O	O	O	O	Global data
			MRT	N/A	O	O	O	O	for tracking
2	L+36 ~ 39	ILAS-II C/O	MDR	ILAS-II, SeaWinds, AMSR, DMS, HK	O				
			MRT	ILAS-II, SeaWinds, DMS	O				
3	L+40 ~ 43	GLI C/O	MDR	GLI 1km, AMSR, SeaWinds, DMS, HK	O				Not global data
			GLI250	GLI 250m	O				including ODR data
			MRT	GLI 1km, SeaWinds, DMS	O				
4	L+44 ~ 52	ETO	MDR	AMSR, GLI 1km, SeaWinds, POLDER*1, DCS*2, TEDA*3, DMS, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	
5	L+53 ~ 55	GLI C/O	MDR	GLI 1km, AMSR, SeaWinds, DCS, TEDA, DMS, HK	O	O*4		O	Not global data
			GLI250	GLI 250m	O			O	including ODR data
			MRT	DCS, SeaWinds, DMS	O	O		O	
6	L+56 ~ 58	ETO	MDR	AMSR, GLI 1km, SeaWinds, POLDER*1, DCS, TEDA, DMS, VMS, HK Source, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	
7	L+59	GLI, ILAS-II C/O	MDR	GLI 1km, ILAS-II, AMSR, SeaWinds, DCS, TEDA, DMS, HK	O				Not global data
			GLI250	GLI 250m	O				including ODR data
			MRT	DCS, SeaWinds, DMS	O				
8	L+60, 61	ETO	MDR	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	
9	L+62	GLI, ILAS-II C/O	MDR	GLI 1km, ILAS-II, AMSR, SeaWinds, DCS, TEDA, DMS, HK	O				Not global data
			GLI250	GLI 250m	O				including ODR data
			MRT	DCS, SeaWinds, DMS	O				
10	L+63 ~ 65	ETO	MDR	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	
11	L+66	GLI, ILAS-II C/O	MDR	GLI 1km, ILAS-II, AMSR, SeaWinds, DCS, TEDA, DMS, HK	O				Not global data
			GLI250	GLI 250m	O				including ODR data
			MRT	DCS, SeaWinds, DMS	O				
12	L+67, 68	ETO	MDR	AMSR, GLI 1km, SeaWinds, POLDER*1, DCS, TEDA, DMS, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	
13	L+69	GLI, ILAS-II C/O	MDR	GLI 1km, ILAS-II, AMSR, SeaWinds, DCS, TEDA, DMS, HK	O				Not global data
			GLI250	GLI 250m	O				including ODR data
			MRT	DCS, SeaWinds, DMS	O				
14	L+70	ETO	MDR	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS, HK	O	O*4	O*4	O*4	Global data
			MRT	DCS	O	O	O	O	

*1: POLDER data: L+48, 56 and 67 *2: DCS data: after L+45 *3: TEDA data: after L+49

*4: POLDER data and GLI 1km data is processed to level 0 data at EOC.

(c) Data Acquisition Pattern for Overseas Ground Stations

Operation	Target	Data Transmission Pattern	Station			Note
			ASF	WFF	KRNS	
AMSR C/O	MDR	Nominal operation pattern of MDR	O	O	O	see Appendix 4
	MRT	Same time as MDR data	O	O	O	covers X1 downlink time
GLI C/O	MDR	Nominal operation pattern of MDR & GLI 250m	O		O	see Appendix 5
	GLI250				O	
	MRT	Same time as MDR and GLI 250m data	O		O	covers X1 downlink time
ETO	MDR	Nominal operation pattern of MDR	O	O	O	see Appendix 4
	MRT	Same time as MDR data	O	O	O	covers X1 downlink time

(d) Implementation Plan

(1) MOIF Preparation and Exchange

a) EOC, NASA stations, Kiruna station, sensor providers and NOAA prepare necessary MOIFs, and exchange them (see 6.2.4).

(2) Data Receiving, Recording and Raw Data Shipping

a) EOC and Kiruna station receive MDR data and GLI 250m data (including ODR data) via X1-band, and receive MRT data via X3-band.
b) NASA stations receive MDR data via X1-band, and receive MRT data via X3-band.
c) Kiruna station records raw data of MRT data, MDR data and GLI 250m (including ODR data) data onto D1 cassettes, and ship them to EOC.
d) NASA stations record raw data of MRT data, MDR data onto D1 cassettes, and ship them to EOC. NASA stations will record MRT data only on a non interfering basis when a third HDDR is available at the station.

(3) Level 0 Data Processing

a) NASA stations process MDR data to level 0 data of AMSR, VMS, DMS, DCS, SeaWinds, TEDA and HK source packet.
b) NASA stations process MRT data to level 0 data of DCS, SeaWinds* and DMS.
*: MRT data is processed to SeaWinds and DMS level 0 data at ASF, in the period from L+53 to 55 days (GLI C/O).
c) Kiruna station processes MDR data to level 0 data of AMSR, VMS, DMS, DCS, SeaWinds, TEDA and HK source packet.
d) Kiruna station process MRT data to level 0 data of DCS and SeaWinds*.
*: MRT data is processed to SeaWinds and DMS level 0 data at Kiruna station, in the period from L+53 to 55 days (GLI C/O).
e) EOC processes MDR data to level 0 data of AMSR, GLI 1km, VMS, DMS, ILAS-II, POLDER*, DCS, SeaWinds, TEDA and HK source packet.
*: Raw data of MDR, which is shipped from NASA stations and Kiruna station using D1 cassette, is also processed.
f) EOC processes MRT data to level 0 data of DCS, SeaWinds* and ILAS-II.
*: MRT data is processed to SeaWinds and DMS level 0 data at EOC, when MDR does not operate continuously.
g) EOC processes GLI 250m data, including raw data from NASA stations and Kiruna station, to level 0 data.
h) EOC processes HK source packet, including receipt data from NASA stations and Kiruna station, to HK TLM data of ILAS-II, DCS, POLDER and TEDA.

(4) Level 0 Data Distribution

a) NASA stations deliver level 0 data of SeaWinds and HK source packet to SeaPAC via network.
b) NASA stations deliver level 0 data of AMSR, VMS, DMS, DCS, TEDA and HK source packet to EOC via network.
c) NASA stations deliver level 0 data of DCS and SeaWinds to NOAA via network.
d) Kiruna station delivers level 0 data of AMSR, VMS, DMS, DCS, SeaWinds, TEDA and HK source packet to EOC via network.
e) EOC delivers level 0 data of SeaWinds and HK source packet, including receipt data from Kiruna station, to SeaPAC via network.
f) EOC delivers level 0 data and HK TLM data of ILAS-II to NIES via network.
g) EOC delivers level 0 data and HK TLM data of TEDA to TKSC/TEDA via network.
h) EOC delivers level 0 data and HK TLM data of DCS to CLS/Japan via network.
i) EOC delivers level 0 data of DCS and SeaWinds to NOAA via network.
j) EOC ships level 0 data of POLDER to CNES/POLDER using D1 cassette, and deliver HK TLM data of POLDER to CNES/POLDER via network.
k) Level 0 data of AMSR, GLI 1km, GLI 250m, VMS and DMS is used within NASDA for evaluation.

l) NOAA forwards level 0 data of DCS, received from EOC and NASA stations, to CLS/Largo via network

(5) Others A

a) Quick delivery of first POLDER checkout image data

In addition to delivery of edited POLDER level 0 data to CNES/POLDER, EOC dumps first checkout image data of POLDER onto 8 mm tape, and provides it to CNES staff stayed in Japan for quick check.

A

b) Processed DMS Data Delivery

NASDA processes DMS level 0 data*, to produce processed DMS data. The processed DMS data is distributed to SeaPAC and CNES/POLDER via network.

*: MDR and MRT data, acquired at EOC, NASA stations and Kiruna station.

(e) Evaluation Items

All participants confirm system capability and operation procedure, shown in below.

(1) Preparing, exchanging and reading MOIFs

a) Format and readability of MOIFs, and file exchange procedure is confirmed by all participants.

b) Accuracy of orbit data and time deference information is evaluated by EOC.

(3) Recording raw data onto D1 cassette

a) Successful completion of raw data recording is confirmed by EOC, NASA stations and Kiruna station.

b) Format and readability of raw data is confirmed by EOC.

(4) Processing level 0 data

a) Successful completion of level 0 data processing is confirmed by EOC, NASA stations and Kiruna station.

b) Format and readability of level 0 data is confirmed by EOC, sensor providers and NOAA.

(5) Shipping raw data from NASA stations and Kiruna station to EOC

a) Media shipping procedure is confirmed by EOC, NASA stations and Kiruna station.

b) Media shipment delay is evaluated by EOC.

(6) Shipping of POLDER level 0 data from EOC to CNES/POLDER

a) Media shipping procedure is confirmed by EOC and CNES/POLDER.

b) Media shipment delay is evaluated by CNES/POLDER.

(7) Sending level 0 data among NASA stations, Kiruna station, EOC, sensor providers and NOAA via network

a) Level 0 data transmission procedure is confirmed by all participants.

(8) Processing and sending processed DMS data A

b) Successful completion of processed DMS data processing is confirmed by EOC.

c) Format and readability of processed DMS data is confirmed by SeaPAC and CNES/POLDER

d) Processed DMS data transmission procedure is confirmed by EOC, SeaPAC and CNES/POLDER.

(f) Data/File Exchange

(1) MOIFs

From	To	Data/File	Media	Comments
EOC	All	EP, ED, TD, ORST, STAD	Network	see section 6.2.4.4
	Kiruna NASA stations	Pass Request	Fax/e-mail	Instead of REQR
		OPLN	Network	For Kiruna station
		SHAQ	Network	
		LV0P	Network	
		EL	Network	For Kiruna station
		RDRM	Network	
	SeaPAC	OPLN	Network	
	NOAA	OPLN	Network	
	CNES/DCS	OPLN	Network	
	CNES/POLDER	OPL1	Network	
		SRZD	Network	
	NIES	OPLN	Network	
	TKSC/TEDA	OPLN	Network	
Kiruna NASA stations	EOC	Reply to Pass Request	Fax/e-mail	Instead of STGS
		RERC/RERB	Network	
		L0RL	Network	
		SRRM	Network	
CNES/POLDER	EOC	RDZD	Network	
TACC	SeaPAC, NIES	Mean Orbit data	e-mail	see section 6.2.4.4 (e)

(2) Mission Data

From	To	Data/File	Media	Comments
EOC	SeaPAC	SeaWinds Level 0	Network	
		HK Source packet	Network	
		SeaWinds, HK TLM*1	Network	TACC data
		Processed DMS data	Network		A
	NOAA	SeaWinds Level 0	Network	
		DCS Level 0	Network	To CLS/Largo via NOAA
	CNES/DCS	DCS Level 0	Network	To CLS/Japan
		DCS HK TLM*1	Network	To CLS/Japan EOC data and TACC data
	CNES/POLDER	POLDER Level 0	D1 cassette	
		POLDER HK TLM*1	Network	EOC data and TACC data
		Processed DMS data	Network		A
	NIES	ILAS-II Level0	Network	
		ILAS-II HK TLM*1	Network	EOC data and TACC data
	TKSC/TEDA	TEDA Level 0	Network	
		TEDA HK TLM*1	Network	EOC data and TACC data
Kiruna NASA stations	EOC	HK Source Packet	Network	
		AMSR Level 0	Network	
		VMS Level 0	Network	
		DMS Level 0	Network	
		DCS Level 0	Network	To CLS/Japan via EOC
		TEDA Level 0	Network	To TKSC/TEDA via EOC
		Raw Data	D1 cassette	MDR, GLI 250m data
Kiruna	EOC	SeaWinds Level 0	Network	To SeaPAC and NOAA via EOC
NASA stations	SeaPAC	SeaWinds Level 0	Network	
		HK Source packet	Network	
	NOAA	SeaWinds Level 0	Network	
		DCS Level 0	Network	To CLS/Largo via NOAA

*1: See the section 6.2.5 abut HK TLM data processing at EOC and TACC.

6.2.3.3.2 DCS Downlink/Uplink Messaging Operation

(a) Participants

- NASDA (EOC)
- Sensor Providers (CNES (DCS))

(b) Schedule

Launch + 109 days ~ 115 days (See the Appendix 3 in detail for schedule of instrument checkout)

(c) Implementation Plan

a) EOC sends Downlink Messaging Request (DMR) to Downlink Messages Management Center (DMMC), and receives Answer to DMR(DMRR) from DMMC.
b) EOC receives Downlink Message (DM) from DMMC, and transmits it from Master Beacon (MB) at EOC to DCS on ADEOS-II.
c) EOC receives Downlink Message transmitted from DCS using NASDA Data Collection Platform (DCP).
d) NASDA Data Collection Platform (DCP) transmits Acknowledgment Message to the DCS on ADEOS-II.
e) EOC receives Request Status (DMRS) from DMMC.
f) EOC requests the DMMC to declare the NASDA DCP as interactive platform.
g) EOC transmits Uplink Message (UM) to DCS using NASDA DCP, and receives Acknowledgment Message from DCS (interactive data collection session).
h) EOC measures EIRP of DCS instrument through the above operations.

(d) Evaluation Items

(1) Downlink Messaging Operation

a) Format and readability of DMR, DMRR and DMRS, and file exchange procedure is confirmed by EOC and DMMC.
b) File exchange procedure of DM is confirmed by EOC and DMMC
c) Successful transmission of DM from MB at EOC to DCS on ADEOS-II is confirmed by using DMMC and the corresponding level 0 data.
d) Successful reception of DM from DCS on ADEOS-II is confirmed by EOC using NASDA DCP. And EIRP of UHF transmitter on DCS instrument is measured.
e) Successful transmission of Ack message from NASDA DCP to DCS on ADEOS-II is confirmed by EOC.
f) Successful reception of DM by NASDA DCP is confirmed by DMMC.

(2) Uplink Messaging Operation

a) Successful transmission of UM from NASDA DCP is confirmed by EOC using the corresponding level 0 data.
b) Successful reception of Ack message from DCS on ADEOS-II is confirmed by EOC. And EIRP of UHF transmitter on DCS instrument is measured.

(e) Data/File Exchange

From	To	Data/File	Media	Comments
EOC	DMMC	DMR	FTP via internet	
DMMC	EOC	DMRR	e-mail via internet	
DMMC	MB at EOC	DM	Network	
DMMC	EOC	DMRS	e-mail via internet	

6.2.3.4 System Total 1 & 2

(a) Participants

- NASDA (EOC, TACC)
- Kiruna station (SSCAS and NRPS)
- NASA stations (ASF, WFF and DSMC)
- Sensor Providers (JPL (SeaPAC), CNES (POLDER, DCS), NIES and TKSC/TEDA)
- Data Utilization Agency (NOAA)

(b) Schedule

Sys-1: Launch + 99 days ~ 102 days (4 days)
Sys-2: Launch + 109 days ~ 115 days (7 days)

(c) Data Acquisition Pattern

Sys-1: Nominal operation pattern of MDR and GLI 250m data is applied (see Appendix 6)
MRT data is acquired in the same time as MDR or GLI 250 m data.
Sys-2: According to the coordination result of REQR/STGS as same as routine operation.

(d) Implementation Plan

(1) MOIF Preparation and Exchange

a) EOC, NASA stations, Kiruna station, sensor providers and NOAA prepare necessary MOIFs, and exchange them (see 6.2.4).
b) For Sys-2 operation, TACC prepare mean orbit data, and send it to NIES and SeaPAC by e-mail via internet.

(2) Data Receiving, Recording and Raw Data Shipping

a) EOC, NASA stations and Kiruna station receive MDR data and GLI 250m data via X1-band, and receive MRT data via X3-band.
b) NASA stations and Kiruna station record raw data of MDR data and GLI 250m data onto D1 cassettes, and ship them to EOC.

(3) Level 0 Data Processing

a) NASA stations process MDR data to level 0 data of AMSR, GLI 1km (subset data for NOAA interest areas), VMS, DMS, ILAS-II, SeaWinds, DCS, TEDA and HK source packet.
b) Kiruna station processes MDR data to level 0 data of AMSR, GLI 1km (subset data for NOAA interest areas), VMS, DMS, ILAS-II, SeaWinds, DCS, TEDA and HK source packet.
c) EOC processes MDR data to level 0 data of AMSR, GLI 1km*, VMS, DMS, ILAS-II, POLDER* SeaWinds, DCS, TEDA and HK source packet.
*: Raw data of MDR, which is shipped from NASA stations and Kiruna station using D1 cassette, is also processed.
d) EOC, NASA stations and Kiruna station process MRT data to level 0 data of DCS.
e) EOC processes GLI 250m data, including raw data from NASA stations and Kiruna station, to level 0 data.
f) EOC processes HK source packet, including receipt data from NASA stations and Kiruna station, to HK TLM data of ILAS-II, DCS, POLDER and TEDA.

(4) Level 0 Data Distribution

a) NASA stations deliver level 0 data of SeaWinds and HK source packet to SeaPAC via network.
b) NASA stations deliver level 0 data of SeaWinds, GLI 1km* and DCS to NOAA via network.
: GLI level 0 subset data and NOAA processed GLI level 1A and level 1B products must not be delivered to any users, who are not approved by NASDA.

c) NASA stations deliver level 0 data of AMSR, VMS, DMS, ILAS-II, DCS, TEDA and HK source packet to EOC via network.
d) Kiruna station delivers level 0 data of AMSR, GLI 1km, VMS, DMS, ILAS-II, DCS, SeaWinds, TEDA and HK source packet to EOC via network.
e) EOC delivers level 0 data of SeaWinds and HK source packet, including receipt data from Kiruna station, to SeaPAC via network.
f) EOC delivers level 0 data of SeaWinds and DCS, including receipt data from Kiruna station, to NOAA via network.
g) EOC delivers level 0 data and HK TLM data of ILAS-II, including receipt data from NASA stations and Kiruna station, to NIES via network.
h) EOC delivers level 0 data and HK TLM data of TEDA, including receipt data from NASA stations and Kiruna station, to TKSC/TEDA via network.
i) EOC delivers level 0 data and HK TLM data of DCS, including receipt data from NASA stations and Kiruna station, to CLS/Japan via network.
j) EOC ships level 0 data of POLDER to CNES/POLDER using D1 cassette, and deliver HK TLM data of POLDER to CNES/POLDER via network.
k) NOAA forwards level 0 data of DCS, received from EOC and NASA stations, to CLS/Largo via network

(5) NRT Product Processing
a) EOC processes AMSR level 0 data, including receipt data from NASA stations and Kiruna station, to AMSR level 1A product. (TBD).
b) EOC processes GLI 1km level 0 data, including receipt data from Kiruna station, to GLI 1km level 1A product (NOAA interest areas and bands are selected.) (TBD)
c) NOAA processes SeaWinds level 0 data, including receipt data from NASA stations and EOC, to SeaWinds Met data. (TBD)

(6) NRT Product Distribution
a) EOC delivers level 1A product of AMSR* to PO.DAAC via network or 8 mm tape (TBD).
b) EOC delivers level 1A product of GLI 1km* to NOAA via network or 8 mm tape. (TBD)
c) PO.DAAC forwards level 1A product of AMSR* to SeaPAC and NOAA via network. (TBD)
*: These level 1A products of AMSR and GLI 1km should be used for the only purpose of system evaluation within PO.DAAC, SeaPAC and NOAA, and must not be delivered to any users, who are not approved by NASDA.
d) NOAA delivers SeaWinds Met data to EOC via network. (TBD)
*: These SeaWinds Met Data should be used for the only purpose of system evaluation within EOC and EORC, and must not be delivered to any users, who are not approved by NASA/JPL.

(7) Others
a) Quick delivery of POLDER level 0 data A
In addition to delivery of whole POLDER level 0 data, EOC will generate POLDER level 0 data from the only EOC data acquired at EOC first pass of Sys-1 phase, before reception of raw data from ASF, WFF and Kiruna station. The POLDER level 0 data is recorded on D1 cassette and shipped to CNES/POLDER, for quick check.

b) Processed DMS Data Delivery A
NASDA processes DMS level 0 data*, to produce processed DMS data. The processed DMS data is distributed to SeaPAC and CNES/POLDER via network.
*: MDR and MRT data, acquired at EOC, NASA stations and Kiruna station.

(e) Evaluation Items

All participants confirm system capability and operation procedure, shown in below.

(1) Preparing, exchanging and reading MOIFs
a) Format and readability of MOIFs, and file exchange procedure is confirmed by all

participants.
b) Accuracy of orbit data and time difference information is evaluated by EOC.
c) Timeline of MOIF exchange is evaluated by all participants.

(2) Recording raw data onto D1 cassette
a) Successful completion of raw data recording is confirmed by EOC, NASA stations and Kiruna station.
b) Format and readability of raw data is confirmed by EOC.

(3) Processing level 0 data
a) Successful completion of level 0 data processing is confirmed by EOC, NASA stations and Kiruna station.
b) Format and readability of level 0 data is confirmed by EOC, sensor providers and NOAA.

(4) Processing NRT products
a) Successful completion of level 1A processing of AMSR and GLI 1km is confirmed by EOC. (TBD)
b) Successful completion of SeaWinds Met data is confirmed by NOAA. (TBD)
c) Format and readability of GLI 1km level 1A product is evaluated by NOAA. (TBD)
d) Format and readability of AMSR level 1A product is evaluated by PO.DAAC and SeaPAC. (TBD)
e) Format and readability of SeaWinds Met data is evaluated by EOC. (TBD)

(5) Shipping raw data from NASA stations and Kiruna station to EOC
a) Media shipping procedure is confirmed by EOC, NASA stations and Kiruna station.
b) Media shipment delay is evaluated by EOC.

(6) Shipping of POLDER level 0 data from EOC to CNES/POLDER
a) Media shipping procedure is confirmed by EOC and CNES/POLDER.
b) Media shipment delay is evaluated by CNES/POLDER.

(7) Sending level 0 data and NRT products among all participants via network
a) Level 0 data and NRT products (AMSR level 1A, GLI 1km level 1A and SeaWinds Met data)(TBD) transmission procedure is confirmed by all participants.
b) Delivery delay of level 0 data and NRT products (TBD) is evaluated by all participants.

(8) Evaluation of total system performance
a) Continuous operation of ADEOS-II Mission Operations System is evaluated by all participants.
b) Network availability is monitored and evaluated by all participants.

(9) Processing and sending processed DMS data A
c) Successful completion of processed DMS data processing is confirmed by EOC.
d) Format and readability of processed DMS data is confirmed by SeaPAC and CNES/POLDER
e) Processed DMS data transmission procedure is confirmed by EOC, SeaPAC and CNES/POLDER.

(f) Data/File Exchange

(1) MOIFs

From	To	Data/File	Media	Sys-1	Sys-2	Comments
EOC	All	EP, ED, TD, ORST, STAD	Network	O	O	see section 6.2.4.4
	Kiruna NASA stations	Pass Request	Fax/e-mail	O		
		REQR	Network		O	
		OPLN	Network	O	O	For Kiruna station
			Network		O	For NASA stations
		SHAQ	Network	O	O	
		LV0P	Network	O	O	
		EL	Network	O	O	For Kiruna station
		RTIG	Network	O	O	
		RDRM	Network	O	O	
	SeaPAC	OPLN	Network	O	O	
	NOAA	OPLN	Network	O	O	
		RTIG	Network	O	O	
	CNES/DCS	OPLN	Network	O	O	
	CNES /POLDER	OPL1	Network	O	O	
		SRZD	Network	O	O	
	NIES	OPLN	Network	O	O	
	TKSC/TEDA	OPLN	Network	O	O	
Kiruna NASA stations	EOC	Reply to Pass Request	Fax/e-mail	O		
		STGS	Network		O	
		RERC/RERB	Network	O	O	
		L0RL	Network	O	O	
		SRRM	Network	O	O	
SeaPAC	EOC	REQQ	Network		O	
CNES /POLDER	EOC	REQQ	Network		O	
		RDZD	Network	O	O	
NIES	EOC	REQQ	Network		O	
TACC	SeaPAC, NIES	Mean Orbit data	e-mail		O	see section 6.2.4.4 (e)

(2) Mission Data

From	To	Data/File	Media	Comments	
EOC	SeaPAC	SeaWinds Level 0	Network	Including Kiruna data	
		HK Source packet	Network	Including Kiruna data	
		Processed DMS data	Network		A
	CNES/DCS	DCS Level 0	Network	To CLS/Japan	
		DCS HK TLM	Network	To CLS/Japan	
	CNES/POLDER	POLDER Level 0	D-1		
		POLDER HK TLM	Network		
		Processed DMS data	Network		A
	NIES	ILAS-II Level0	Network		
		ILAS-II HK TLM	Network		
	TKSC/TEDA	TEDA Level 0	Network		
		TEDA HK TLM	Network		
	PO.DAAC	AMSR L1A (TBD)	Network/tape		
	NOAA	SeaWinds Level 0	Network		
		DCS Level 0	Network	To CLS/Largo via NOAA	
		GLI L1A (TBD)	Network/tape	NOAA interest areas and bands	
Kiruna NASA Stations	EOC	HK Source Packet	Network		
		AMSR Level 0	Network		
		VMS Level 0	Network		
		DMS Level 0	Network		
		ILAS-II Level 0	Network	To NIES via EOC	
		TEDA Level 0	Network	To TKSC/TEDA via EOC	
		DCS Level 0	Network	To CLS/Japan via EOC	
		Raw Data	D-1	MDR, GLI	
Kiruna	EOC	GLI Level 0	Network	NOAA interest areas	
		SeaWinds Level 0	Network	To SeaPAC and NOAA via EOC	
NOAA	EOC	SeaWinds Met data (TBD)	Network		
NASA stations	SeaPAC	SeaWinds Level 0	Network		
		HK Source packet	Network		
	NOAA	SeaWinds Level 0	Network		
		GLI Level 0	Network	NOAA interest areas	
		DCS Level 0	Network	To CLS/Largo via NOAA	

6.2.4 MOIF Interface

In this Initial Operation and Evaluation Phase 1 except for Sys-2, mission operation information will be exchanged between the related agencies in accordance with the following policy.

6.2.4.1 Pass Assignment

Necessary passes of overseas ground stations to acquire mission data are assigned through the following procedure.

(a) Pre-coordination before launch

NASDA and overseas ground stations make detailed pattern of data acquisition through coordination by Fax, e-mail or face-to-face meeting in advance. The data acquisition pattern is fixed before 1 month of launch.

(1) VMS/DMS Data Acquisition at Kiruna station

Relative revolution from EOC first contact of the target day is informed as data acquisition pattern (see section 6.2.3.1 of this document)

(2) Data Acquisition and Level 0 Data Processing Test at Ground Stations

Relative revolution from EOC first contact of the target day is informed as data acquisition pattern (see section 6.2.3.2 of this document)

(3) Instrument Checkout (AMSR C/O, GLI C/O and ETO operation)

Nominal operation pattern of MDR and GLI 250m is informed as data acquisition pattern (see section 6.2.3.1, Appendix 4 and Appendix 5)

a) Fixed operation pattern of 1 recurrent cycle (4 days) is used repeatedly.
b) Relationship between actual data acquisition date and path is not fixed.

(4) Sys-1

Nominal operation pattern of MDR and GLI 250m is informed as data acquisition pattern for 4 days of Sys-1 operation (see Appendix 6)

a) Relationship between actual data acquisition date and path is not fixed.

(5) Sys-2

Pre-coordination is not necessary, because necessary passes of overseas stations are assigned through REQR/STGS coordination as same as routine operation.

(b) Pass Assignment (except for Sys-2)

After launch, NASDA will inform overseas ground stations of several kind of information to assign necessary passes, as shown in below.

(1) Nominal Operation Pattern of MDR and GLI 250m

After completion of orbit control to throw ADEOS-II into nominal orbit, NASDA will update the nominal operation pattern of MDR and GLI 250m (Appendix 4, 5 and 6) to fix the relationship between actual data acquisition date and path, and will provide them to overseas ground stations.

a) Target Operation

- ✓ Instrument Checkout (AMSR C/O, GLI C/O and ETO operation)
- ✓ Sys-1

b) Delivery Timing & Frequency

- ✓ 1st: around 30 days after launch
- ✓ As needed (when relationship between date and path is shifted due to orbit maneuver.)

(2) Weekly Support Request

NASDA will make weekly operation schedule 2 weeks before the operation target week. Based on this weekly schedule, NASDA will inform overseas ground stations of the data acquisition plan for the target week by using specified notification form via Fax and e-mail (see Appendix 2.2).

a) Target Operation

- ✓ Instrument Checkout (GLI C/O and ETO operation)
- ✓ Sys-1

b) Coverage of Target Week

- ✓ 1 week from Monday to Sunday

c) Delivery Timing & Frequency

- ✓ Frequency: every week
- ✓ Timing: Thursday 11 days before beginning of target week

(3) Daily Support Request

Before target day of data acquisition, NASDA will provide the following information to overseas ground stations, as daily data acquisition plan, by using specified notification form via Fax and e-mail (see Appendix 2.3).

- ✓ Data acquisition date (Actual date)
- ✓ Data acquisition path and Data acquisition start/end time
- ✓ Data acquisition mode (X1/MDR or X1/GLI 250m or X3/MRT)

a) Target Operation

- ✓ Data Acquisition and Level 0 Data Processing Test
- ✓ Instrument Checkout (AMSR C/O, GLI C/O and ETO operation)
- ✓ Sys-1

b) Delivery Timing & Frequency

- ✓ Frequency: before every target day
- ✓ Timing: 2 days before target day

(c) Pass Assignment (For Sys-2)

For sys-2 operation, pass assignment of overseas ground stations is made by using REQR/STGS as same as routine operation.

The REQR covers operation target week (1 week), and is provided from EOC to overseas ground stations via network before 8:00 UT on Thursday 3 weeks before the beginning of target week. Overseas ground stations prepare STGS as reply to the REQR, and provide it to EOC via network before 1:00 UT on Friday the next day of REQR receipt. If the STGS includes rejection of pass required by the REQR, REQR/STGS coordination will be repeated in accordance with the same rules as routine operation.

The coordination scheme for pass assignment is shown in below, except for Sys-2.

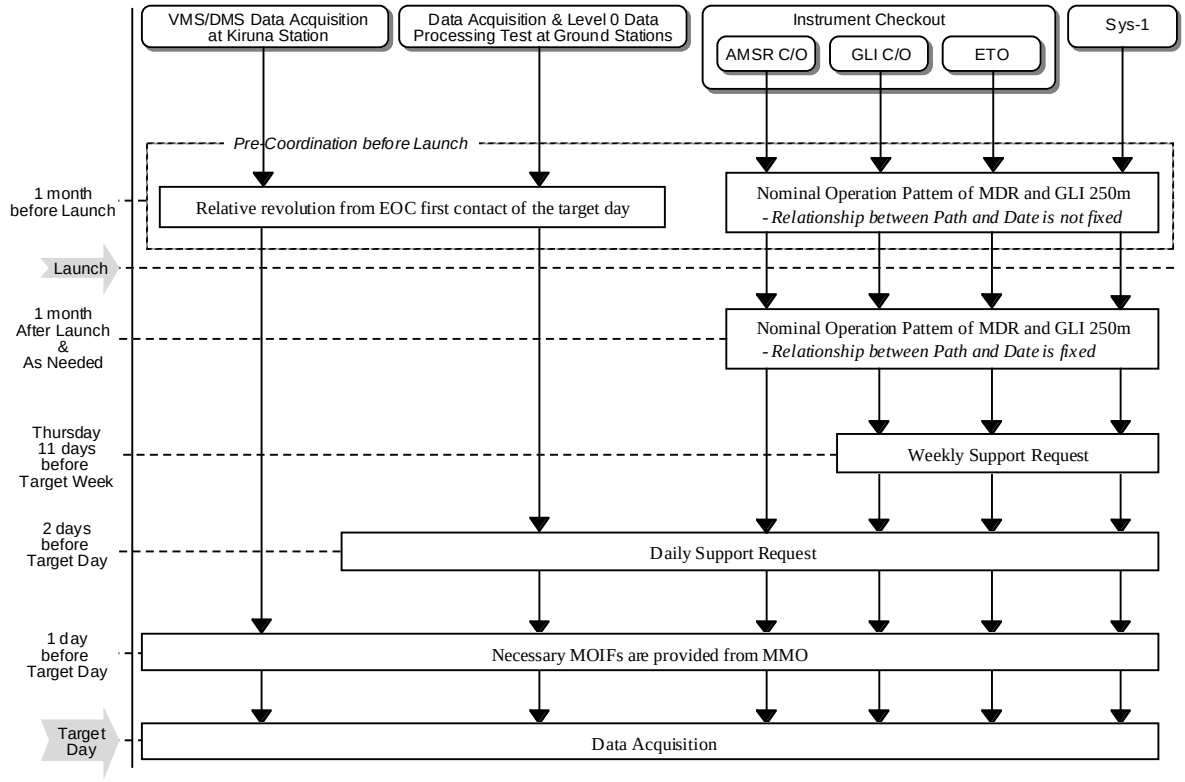


Fig. 6.2-1 Coordination Scheme for Pass Assignment

6.2.4.2 Operation Request

Except for Sys-2, operations of all mission instruments are scheduled by ADEOS-II project in accordance with the SOCP.
For Sys-2, SeaPAC, CNES/POLDER and NIES provide REQQ file to EOC in accordance with the same rules as routine operation. Operation of DCS and TEDA is scheduled by NASDA in the same condition as routine operation.

6.2.4.3 Operation Plan

EOC prepares the following MOIFs, and delivers them to the related agencies via network.

- ✓ To overseas ground stations: OPLN, SHAQ, LV0P, RTIG
- ✓ To sensor providers: OPLN (OPL1 for CNES/POLDER)
- ✓ To NOAA: OPLN, RTIG

For Sys-1 and Sys-2, these MOIFs are provided to related agencies in accordance with the same time line as routine operation. However, except for Sys-1 and Sys-2, these MOIFs are provided in accordance with the following rules.

(a) Frequency

Delivery frequency of the above MOIFs depends on checkout operation procedure, i.e. it does not accord to the timeline of routine operation. As normal case, these MOIFs are delivered every day to the related agencies by 8:00 UT 1 day before the target day of operation.

(b) Coverage

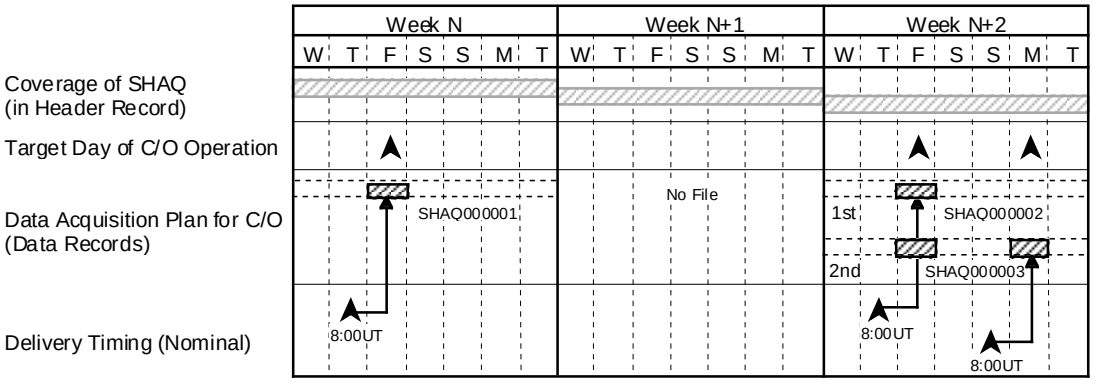
Each MOIF includes data records of operation plan for only target day and the previous days within its coverage, which is specified in the header record of MOIF (i.e OPLN/OPL1 & SHAQ: 1 week, LV0P & RTIG: 2 or 3 days).

For example, if two operation days are planned within 1 week coverage of SHAQ, the SHAQ of 1st target day includes data acquisition plan of 1st target day only, but the SHAQ of 2nd target day includes data acquisition plan of both 1st and 2nd target days.

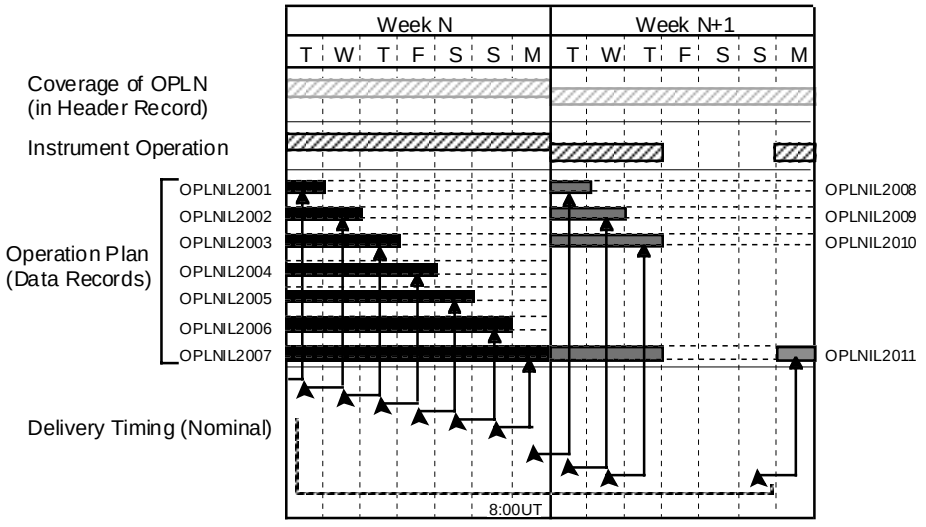
On the other hand, if there is no operation plan within target coverage of a MOIF, the MOIF is not provided from MMO.

(c) File Name

File name of the MOIF is sequentially increased.



(a) SHAQ for Overseas Ground Stations



(b) OPLN for ILAS-II

Fig. 6.2-2 Example of MOIF for C/O Operation

6.2.4.4 Other MOIFs

(a) Data Recording Result and Level 0 Data Processing Result

Overseas stations create RERC and L0RL in accordance with the SHAQ and LV0P provided from EOC, and transfer them to EOC.

For RERC and L0RL creation at overseas station, the same rules as routine operation are applied. (i.e., overseas stations will create these MOIFs respectively for each downlink.)

When MRT data is recorded onto D1 cassette at overseas stations, information about MRT data recording is not needed in the RERC file for X3-band data acquisition. Therefore, the following records in the RERC are filled by asterisks "*".

- ✓ Raw Tape No.
- ✓ Start/Stop Tape ID
- ✓ Begin/End Time of Recording
- ✓ Recording Status

(b) Orbit Data

(1) Before Completion of Orbit Adjustment

During the period to perform orbit adjustment scheduled from Launch + 2days to around 30 days, EOC will provide all related agencies with the orbit data of ADOES-II 1 day before the target day of orbit maneuver. Maneuver for orbit adjustment is planned to perform around every 3 days during this period.

The orbit data provided during this period is prepared by MMO as predictive orbit data and is provided to all related agencies as EP or EL file. MMO will prepare 8 EP and EL files, which includes the orbit data of the maneuver day, previous 3 days and next 4 days. The predictive orbit data in EP and EL files is considering expected orbit shifting due to maneuver.

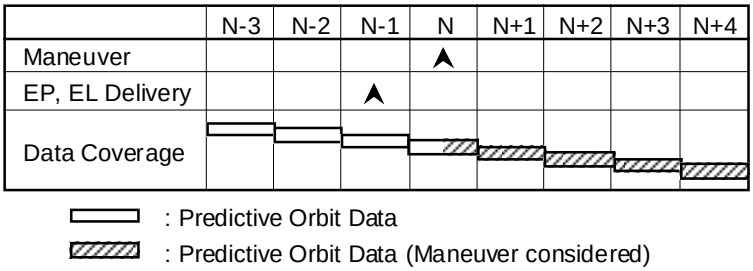


Fig. 6.2-3 Orbit Data Delivery Pattern (before completion of orbit adjustment)

(2) After Completion of Orbit Adjustment

After completion of orbit adjustment, orbit data will be provided from EOC to all related agencies in accordance with the same rules as routine operation, that is specified in the section 5.1.4 of MOIS (common part).

(c) Time Difference Information

From the 27 days after launch, EOC will prepare TD file every day to provide time difference information to all related agencies.

(d) Media Shipment and Readability Report

For all media of X1-band raw data and POLDER level 0 data, media shipment/readability report will be exchanged, when a media is shipped between EOC and the related agencies. i.e., SRRM and RDRM file is exchanged between overseas stations and EOC for raw data media shipment, and SRZD and RDZD file is exchanged between CNES/POLDER and EOC for POLDER level 0 data

media shipment. Moreover, for raw data media shipment from NIPR, SRRM is not used as same rules as routine operation.

(e) Mean Orbit Data

Mean orbit data is prepared by TACC in accordance with the following rules, and provided to NIES and SeaPAC by using e-mail.

- ✓ 1st delivery: At the time of completion for the initial orbit control to fix RSP (around 30 days after launch)
- ✓ Data update: Each time to perform +ΔV orbit maneuver

(f) Status Report

(1) Maneuver Information

In the same time as mean orbit data shown in above (e), +ΔV orbit maneuver plan is informed to all related agencies by using STAD file.

(2) Operation Status

From L+34 days (beginning of Instrument C/O), MMO prepares ORST file to inform all related agencies of the data acquisition status of all ground stations.

6.2.4.5 Special Case for VMS/DMS Data Acquisition at Kiruna

On the launch day, MRT data is received at Kiruna station, to acquire VMS and DMS data of just after the launch. For this operation, EOC will provide OPLN, SHAQ, LV0P and EL file to Kiruna station. However, sending method and timing of these files is different from the rules shown in above.

(a) Operation Plan

MMO will prepare necessary OPLN, SHAQ and LV0P file, and provide them to Kiruna station before launch by using e-mail.

Time information in these MOIFs will be updated at Kiruna station before data acquisition, based on the orbit data provided from MMO after launch.

(b) Orbit Data

After launch, MMO will provide EL file twice to Kiruna station via same network as routine operation. The 1st EL file will be used for VMS/DMS data acquisition during 5th revolution, and provided 4 hours before 5th revolution at latest. The 2nd EL file will be provided around 2.5 hours before 6th revolution. It will be used for backup data acquisition, if data acquisition in 5th revolution fails.

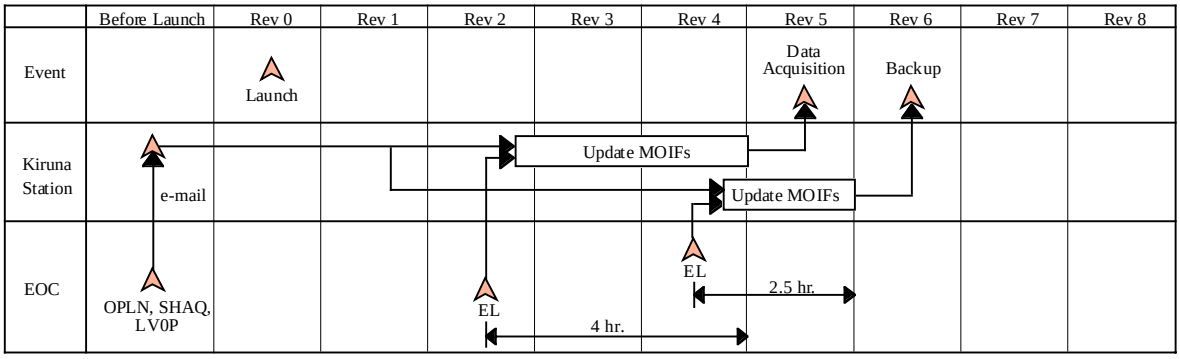


Fig. 6.2-4 MOIF Exchange for VMS/DMS Data Acquisition at Kiruna Station

6.2.4.6 Urgent Rescheduling

If data acquisition pattern is suddenly changed, EOC updates the corresponding MOIFs (REQR, SHAQ, LV0P, RTIG and others, if needed), and provides them to overseas station in accordance with the rules and procedure specified in the “Ground System Operations Procedure for ADEOS-II Mission Operation”

6.2.5 HK TLM Data Distribution

(a) TACC

During checkout phase, TACC will generate HK TLM data of SeaWinds, ILAS-II, DCS, POLDER and TEDA in accordance with the schedule specified in the document "HK Data Distribution Schedule", and will distribute them to sensor providers via network through EOC.

(b) EOC

In addition to the TACC HK TLM data, EOC will process MDR data (HK source packet) to HK TLM data of ILAS-II, DCS, POLDER and TEDA and provide it to sensor providers in accordance with the same rules as routine operation, when MDR data is acquired at EOC, NASA stations and Kiruna station. Moreover, for SeaWinds, HK source packet data is provided from EOC (including Kiruna data), ASF and WFF to SeaPAC as same as routine operation.
The EOC HK TLM data is provided in the period shown in below.

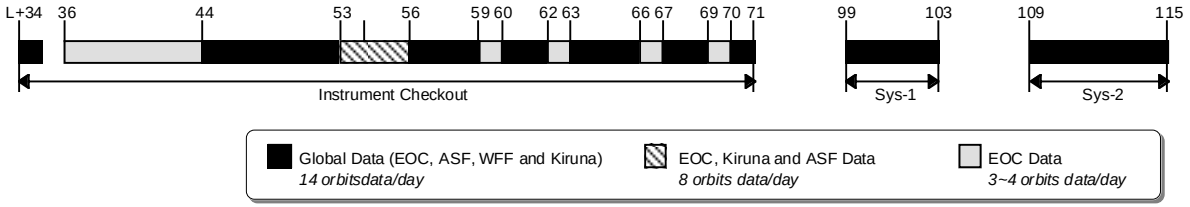


Fig. 6.2-5 EOC HK TLM data/HK Source Packet Data Acquisition Pattern

6.2.6 Command Operation

(a) Command Generation

(1) Except for Sys-2

Commands of all mission instruments are generated within NASDA in accordance with "SOCP".

(2) For Sys-2

Commands of SeaWinds, POLDER and ILAS-II are generated from REQQ file, as same as routine operation. Commands of DCS and TEDA are generated in accordance with the operation schedule planned by MMO in the same condition as routine operation.

(3) Instrument Parameter

Instrument parameter will be provided from sensor providers to NASDA by using mutually agreed procedure, when parameter updating is necessary during checkout phase.
As the especially relating matter for ground segment operation, SeaWinds parameter will be provided from SeaPAC to NASDA in accordance with the same procedure as routine operation, i.e. SWPF will be prepared by SeaPAC, transmitted to NASDA/EOC and forwarded to NASDA/TACC.

(b) Command Execution

(1) Except for Sys-1 and Sys-2

All mission instruments and bus instruments are operated by real time commands or stored commands.

(2) For Sys-1 and Sys-2

All mission instruments and bus instruments are operated by automatic commands from OBC.

6.2.7 Media Shipment

6.2.7.1 Raw Data

(a) Media Shipment Procedure

NASA stations, Kiruna station and NIPR will;

- record raw data on D1 cassettes;
- fill up the designated items of label and affix it to the D1 cassettes;
- fill up the designated items of "X3-band Tape Recording Description Form";
- pack D1 cassettes and "X3-band Tape Recording Description Form" in a duralmin case;
- and ship them to EOC.
  Note: D1 cassettes of MRT data and"X3-band Tape Recording Description Form" are not applicable for NIPR.

(b) Label Format

(1) X1-band Data (MDR, GLI 250m and 60 Mbps PN code)
The same label format as routine operation is applied.

(2) X3-band Data (MRT) *(N/A for NIPR)*

Format: MRT-SSSS-nnn

MRT: MRT data (fix)
SSSS: Station Name (3 or 4 characters)

- ✓ *ASF: ASF*
- ✓ *WFF: WFF*
- ✓ *Kiruna: KRNS*

nnn: Sequential number

(c) X3-band Tape Recording Description Form (N/A for NIPR)

In the X3-band Tape Recording Description Form, following information will be described.

- For each media
  - ✓ *Data receiving station*
  - ✓ *Data receiving begin/end date*
  - ✓ *Label information (MRT-SSSS-nnn)*
  - ✓ *Raw tape number (DSSMnnnnnn)*
- For each downlink
  - ✓ *Downlink path number (Pddddnnssss)*
  - ✓ *Downlink segment number (Dxxxddddsss-zz)*
  - ✓ *Positional ID of recording start (NNNNNN)*
  - ✓ *Positional ID of recording stop (NNNNNN)*

The format of X3-band Tape Recording Description Form is attached to this IOEP as the Appendix A2.4.

(d) Media Shipment Frequency
Except for Sys-2 operation, raw data media (D1 cassettes) of X1-band data and X3-band data are shipped from ASF, WFF and Kiruna station, in accordance with the different frequency from routine

operation. The media shipment schedule for ASF, WFF and Kiruna station is shown in the Appendix 3.

As for media shipment from NIPR (Showa base) to EOC, the raw data media (D1 cassettes) of X-1 band data are shipped in the middle of April by south-pole observation ship “Shirase”.

6.2.7.2 POLDER Level 0 Data

(a) Media Shipment Procedure

EOC will;

- record POLDER level 0 data on D1 cassette;
- fill up the designated items of label and affix it to the D1 cassette;
- pack it in an envelope;
- and ship it to CNES/POLDER.

(b) Label Format

The same label format as routine operation is applied.

6.3 Initial Operation and Evaluation Phase 2 & 3

During this phase, product processing system at each agency will be evaluated and tuned up, and level 1 and/or higher level products will be calibrated and validated.
These evaluation activities will be performed in accordance with the plan and procedure within each agency. Therefore, no evaluation operations are required between NASDA and related agencies.

6.4 Initial Operation Evaluation Plan for Mode 1

Data relay capability between ADEOS-II space craft and feeder link ground stations through data relay satellites (DRTS and ARTEMIS) will be evaluated during Initial Operation and Evaluation Phase 1 (Launch + 71 days ~ 90 days).
In this mode 1 test phase, MDR data, MRT data and GLI 250m data will be received at EOC Feeder Link Station in accordance with the operation plan shown in below.

(a) Participants

- NASDA (EOC, TACC)
- Sensor Providers (JPL (SeaPAC), CNES(POLDER, DCS) and TKSC/TEDA) A
- Data Utilization Agency (NOAA)

- Others (for only MOIF exchange)
  - ✓ *Kiruna station (SSCAS and NRPS)*
  - ✓ *NASA stations (ASF, WFF and DSMC)*
  - ✓ *Sensor Providers (~~CNES (POLDER) and~~ NIES)* A

(b) Schedule

No.	Schedule	Mission Data		Note
1	L+73	MRT	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS,	
2	L+78 ~ 82	MDR	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS,	Not global data
		GLI 250	GLI 250m	including ODR data
		MRT	AMSR, GLI 1km, SeaWinds, DCS, TEDA, DMS,	

(c) Implementation Plan

(1) MOIF Preparation and Exchange
a) EOC prepares necessary MOIFs and provide them to all participants.

(2) Data Receiving and Level 0 Data Processing
b) EOC receives raw data of MRT data, MDR data and GLI 250m data, and processes them to level 0 data of AMSR, GLI, SeaWinds, DCS, TEDA and DMS.

(3) Level 0 Data Distribution
a) EOC delivers level 0 data of SeaWinds to SeaPAC and NOAA via network.
b) EOC delivers level 0 data of DCS to CLS/Japan and NOAA via network.
c) EOC delivers level 0 data of TEDA to TKSC/TEDA via network.
d) Level 0 data of AMSR, GLI 1km, GLI 250m and DMS is used within NASDA for evaluation.

(4) Others A
a) Processed DMS Data Delivery
NASDA processes DMS level 0 data*, to produce processed DMS data. The processed DMS data is distributed to SeaPAC and CNES/POLDER via network.
*: MDR and MRT data, acquired at EOC.

(d) Evaluation Items

All participants confirm system capability and operation procedure, shown in below.

(1) Preparing, exchanging and reading MOIFs

a) Format and readability of MOIFs, and file exchange procedure is confirmed by all participants.

(2) Processing level 0 data

a) Successful completion of level 0 data processing is confirmed by EOC.
b) Format and readability of level 0 data is confirmed by sensor providers and NOAA.

(3) Sending level 0 data

a) Level 0 data transmission procedure is confirmed by all participants.

(4) Processing and sending processed DMS data A

a) Successful completion of processed DMS data processing is confirmed by EOC.
b) Format and readability of processed DMS data is confirmed by SeaPAC and CNES/POLDER
c) Processed DMS data transmission procedure is confirmed by EOC, SeaPAC and CNES/POLDER.

(e) Others

During this mode 1 test phase, HK TLM data is processed by TACC and distributed to sensor providers in accordance with the schedule specified in the document “HK Data Distribution Schedule”

(f) Data/File Exchange

(1) MOIFs

From	To	Data/File	Media	Comments
EOC	All	EP, ED, TD, ORST, STAD	Network	see section 6.2.4.4
	SeaPAC	OPLN	Network	
	NOAA	OPLN	Network	
	CNES/DCS	OPLN	Network	
	TKSC/TEDA	OPLN	Network	
TACC	SeaPAC, NIES	Mean Orbit data	e-mail	see section 6.2.4.4 (e)

(2) Mission Data

From	To	Data/File	Media	Comments	
EOC	SeaPAC	SeaWinds Level 0	Network		
		Processed DMS data	Network		A
	NOAA	SeaWinds Level 0	Network		
		DCS Level 0	Network	To CLS/Largo via NOAA	
	CNES/DCS	DCS Level 0	Network	To CLS/Japan	
	CNES/POLDER	Processed DMS data	Network		A
	TKSC/TEDA	TEDA Level 0	Network		

7 Operation Review

At the end of each phase, which is defined in the chapter 4, operation review meeting will be held to confirm finalization of every evaluation item of the previous phase, and to confirm readiness for the next phase. In this chapter, confirmation items of operation review are specified.

7.1 Confirmation Items for Initial Operation Evaluation

- Completion of every evaluation items, which are specified in this IOEP.
- All problems during each initial operation evaluation phase are closed
- All change points of related documents due to the result of initial operation evaluation are clarified.
- All instruction items, which should be informed to operators, are clarified.

7.2 Confirmation Items for Operators

- Completion of operation training items, which are specified in the Operation Training Plan.
- Operators understand necessary operation tasks, which are described in related documents to operation, such as operation plan document, instruction manual of each system and so on.
- Operation procedure document is issued.

Appendix 1 Acronyms and Abbreviations

A

ADEOS-II	:	Advanced Earth Observing Satellite-II
AMSR	:	Advanced Microwave Scanning Radiometer
ARTEMIS	:	Advanced Relay and Technology Mission Satellite
ASF	:	Alaska SAR Facility

B

BER	:	Bit Error Rate

C

CNES	:	Centre National d Etudes Spatiales
COO	:	Continuous Operation Evaluation

D

DCP	:	Data Collection Platform
DCS	:	Data Collection System
DMS	:	Dynamics Monitoring System
DRTS	:	Data Relay and Tracking Satellite
DSMC	:	Data Serviced Management Center (NASA)
DT	:	Direct Transmission

E

ED	:	Definitive Orbital Elements (MOIF)
EOC	:	Earth Observation Center (NASDA)
EOIS	:	Earth Observation Data and Information System (NASDA)
EP	:	Predictive Orbital Elements (MOIF)

G

GLI	:	Global Imager

I

ILAS-II	:	Improved Limb Atmospheric Spectrometer-II
IOCS	:	Inter Orbit Communication System

J

JAFIC	:	Japan Fisheries Information Service Center
JMA	:	Japan Meteorological Agency
JPL	:	Jet Propulsion Laboratory (NASA)

L

L0RL	:	Level 0 Processing Result (MOIF)
LV0P	:	Level 0 Processing Information (MOIF)

M

MDR	:	Mission Data Recorder
MMO	:	Mission Operation Management Organization (NASDA)
MOIF	:	Mission Operation Information File
MPT	:	Mission Planning Timeline Evaluation
MRT	:	Mission Real Time

N

NASA	:	National Aeronautic and Space Administration
NASDA	:	National Space Development Agency of Japan
NIES	:	National Institute for Environmental Studies
NIPR	:	National Institute of Polar Research
NOAA	:	National Oceanic and Atmospheric Administration
NRT	:	Near Real Time

O

OBC	:	On Board Computer
OPL1	:	Operation Plan for POLDER (MOIF)
OPLN	:	Operation Plan (MOIF)

P

PDL	:	Paddle
PO.DAAC	:	Physical Oceanography Distributed Active Archive Center
POLDER	:	Polarization and Directionality of the Earth's Reflectances

R

RDRM	:	Readability Report of Raw Media (MOIF)
REQQ	:	Request for 1 week period (MOIF)
REQR	:	Request for Raw Data Record (MOIF)
RTIG	:	Real Time Processing Information for GLI (MOIF)

S

SeaPAC	:	SeaWinds Processing and Analysis Center (NASA)
SRRM	:	Shipment Report of Raw Media (MOIF)
STGS	:	Status of Ground Station (MOIF)

T

TACC	:	Tracking and Control Center (NASDA)
TEDA	:	Technical Data Acquisition Equipment
TF	:	Transfer Frame
TFG	:	Transfer Frame Generator
TD	:	Time Difference (MOIF)
TKSC	:	Tsukuba Space Center (NASDA)

V

VMS	:	Visual Monitoring System

W

WFF	:	Wallops Flight Facility

Appendix 2 Format

A2.1 Problem Report Format

(1) Sample Sheet

Problem Report No.	
Problem First Notification No.	
R SOP-16 Report No.	
R SOP-30 Report No.	

ADEOS-II Initial Operation and Evaluation Problem Report

GMEP No.		**Date (UT)**	/ /	**Time (UT)**	: :
Operation Name				**Path (or Rev)**	
Agency		**Reporter**			
SUBJECT					

PROBLEM DESCRIPTION

Influence on operation (Yes / No)
Scheduled measures date / /

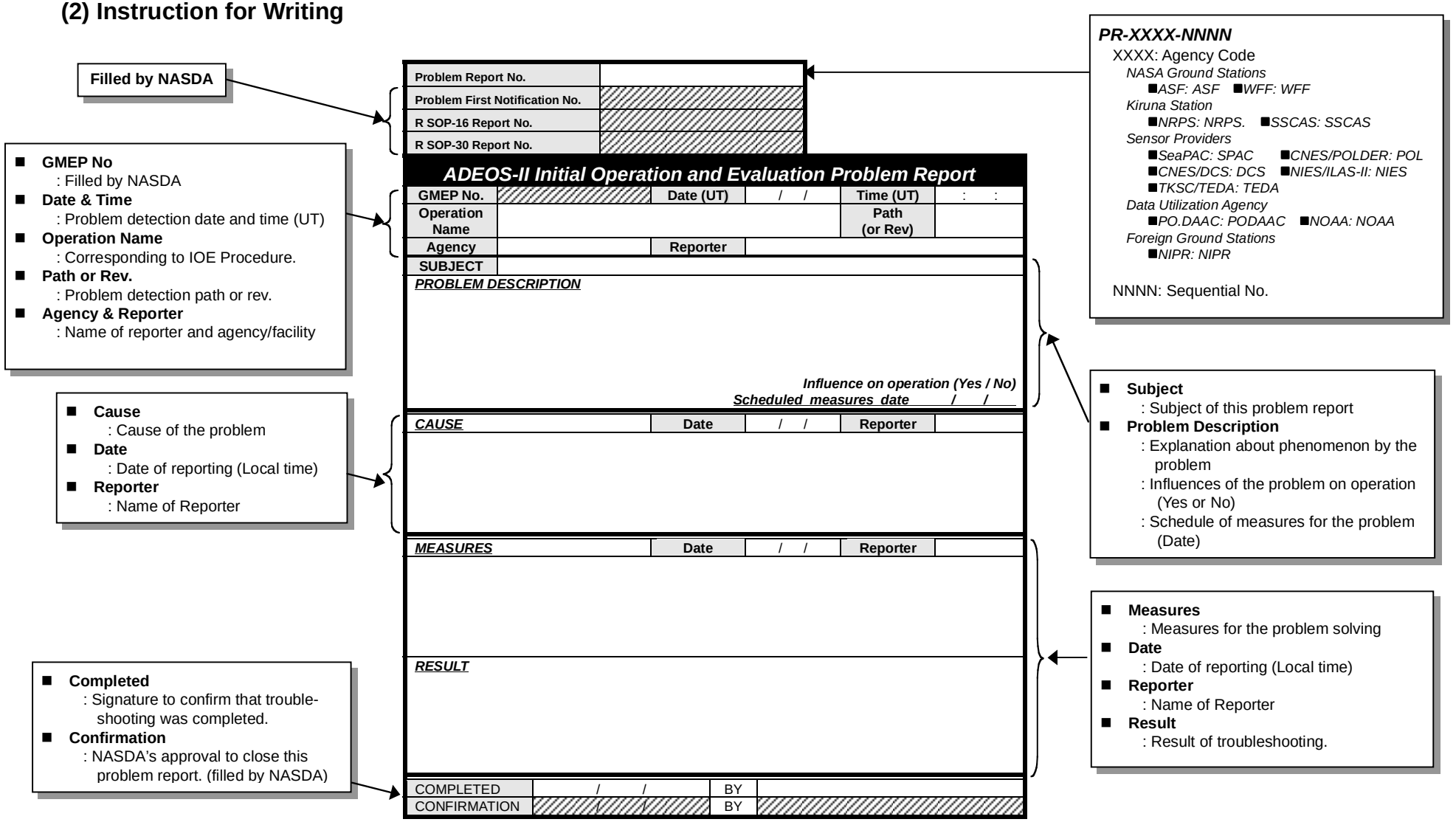
CAUSE	**Date (UT)**	/ /	**Reporter**	

MEASURES	**Date (UT)**	/ /	**Reporter**	

RESULT

COMPLETED	/ /	BY	
CONFIRMATION	/ /	BY	

(2) Instruction for Writing



A2.2 Weekly Support Request Format

ADEOS-II Initial Operation and Evaluation Phase
Weekly Support Request Fax

This Fax contain request information for ADEOS II support of 1 week at Overseas Ground Stations (ASF, WFF and Kiruna Station).

To	☐ DSMC White Sands	Fax: +1-505-527-7233	E-mail: wsnso@mail.wsc.nasa.gov
	☐ ASF	Fax: +1-907-474-5195	E-mail: ops@asf.alaska.edu
	☐ WFF	Fax: +1-757-824-2403	E-mail: wotssl@listserv.gsfc.nasa.gov
	☐ Kiruna	Fax. +46-980-182-50	E-mail: christer.jonsson@esrange.ssc.se
			cc: ntwx_space@mui.biglobe.ne.jp

Target Week	From	/ /	To	/ /	

Weekly Support Request

Date		**Rev.**													
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
M	/														
T	/														
W	/														
T	/														
F	/														
S	/														
S	/														

A: ASF W: WFF K: Kiruna E: EOC

Comments	
POC for Questions	Name: Tel.: Fax.: E-mail:

A2.3 Daily Support Request Format

ADEOS-II Initial Operation and Evaluation Phase ***Daily Support Request Fax***			
This Fax contain request information for ADEOS II support of Target day at Overseas Ground Stations (ASF, WFF and Kiruna Station).			
To	☐ DSMC White Sands ☐ ASF ☐ WFF ☐ Kiruna	Fax: +1-505-527-7233 Fax: +1-907-474-5195 Fax: +1-757-824-2403 Fax. +46-980-182-50	E-mail: wsnso@mail.wsc.nasa.gov E-mail: ops@asf.alaska.edu E-mail: wotssl@listserv.gsfc.nasa.gov E-mail: christer.jonsson@esrange.ssc.se cc: ntwx_space@mui.biglobe.ne.jp
Target Day	/ /		

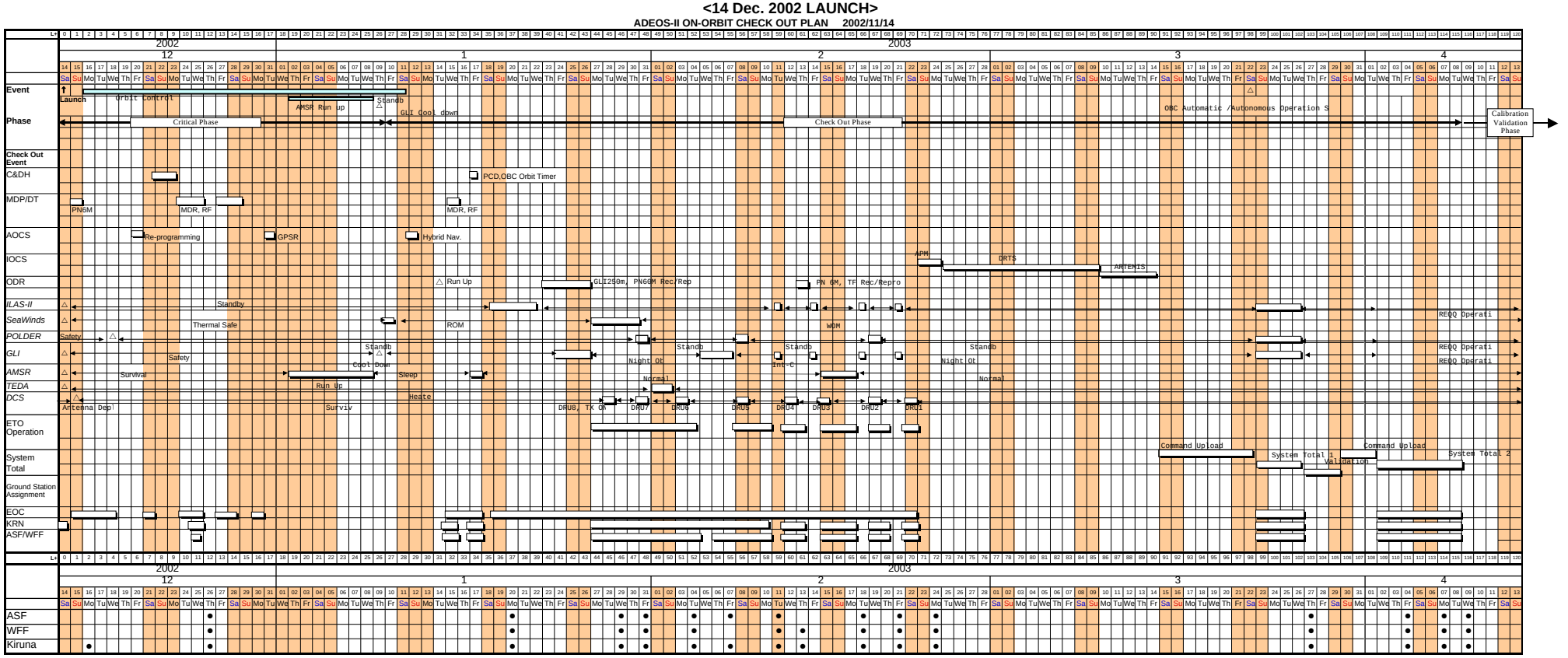
Daily Support Request **Ground Station: ■ ASF ■ WFF ■ Kiruna Station**				
Path	**AOS (UTC) (hh:mm:ss)**	**LOS (UTC) (hh:mm:ss)**	**Band (X1/X3)**	**Acquisition Mode (PN60*1/MRT/MDR/GLI)**
*1: 60 Mbps PN Code is indicated as “GLI” in the SHAQ file.				

Comments	
POC for Questions	Name: Tel.: Fax.: E-mail:

A2.4 X3-band Tape Recording Description Form

ADEOS-II Initial Operation and Evaluation Phase ***X3-band Tape Recording Description Form***					
Receiving Station	☐ ASF ☐ WFF ☐ Kiruna Station				
Receiving Date	Begin		End		
Media Information					
Label Information					
Raw Tape Number					
Downlink Information					
1	Downlink Path No.				
	Downlink Segment No.				
	Position ID	Start		Stop	
2	Downlink Path No.				
	Downlink Segment No.				
	Position ID	Start		Stop	
3	Downlink Path No.				
	Downlink Segment No.				
	Position ID	Start		Stop	
4	Downlink Path No.				
	Downlink Segment No.				
	Position ID	Start		Stop	
N	Downlink Path No.				
	Downlink Segment No.				
	Position ID	Start		Stop	

Appendix 3 ADEOS-II Initial Checkout Schedule



● shipping day of raw data media ▯: Japanese Holiday

Appendix 4 MDR Nominal Operation Pattern

(1) MDR Operation Pattern of 1 Recurrent Cycle (4 days)

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP		
				aos	los	aos-los	aos (aos+13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time
1	MDR & MRT	HEOC	4	0:46:45	0:58:38	0:11:53	0:46:58	0:58:37	0:11:39							
	MDR & MRT	WFF	8	1:59:12	2:10:08	0:10:56	1:59:25	2:10:07	0:10:42							
	MDR & MRT	WFF	12	3:38:27	3:50:16	0:11:49	3:38:40	3:50:15	0:11:35							
	MDR & MRT	ASF	16	5:29:08	5:41:04	0:11:56	5:29:21	5:41:03	0:11:42							
	MDR & MRT	ASF	20	7:08:16	7:21:02	0:12:46	7:08:29	7:21:01	0:12:32							
	MDR & MRT	ASF	24	8:49:40	9:00:52	0:11:12	8:49:53	9:00:51	0:10:58							
	MDR & MRT	KRNS	28	10:42:41	10:55:27	0:12:46	10:42:54	10:55:26	0:12:32							
	MDR & MRT	HEOC	32	12:04:04	12:16:08	0:12:04	12:04:17	12:16:07	0:11:50							
	MDR & MRT	HEOC	36	13:46:10	13:54:39	0:08:29	13:46:23	13:54:38	0:08:15							
	MDR & MRT	KRNS	36	14:01:50	14:12:24	0:10:34	14:02:03	14:12:23	0:10:20							
	MDR & MRT	WFF	40	15:54:47	16:07:26	0:12:39	15:55:00	16:07:25	0:12:25							
	MDR & MRT	KRNS	44	17:18:23	17:30:00	0:11:36	17:18:36	17:29:59	0:11:22							
	MDR & MRT	ASF	48	19:10:50	19:21:03	0:10:13	19:11:03	19:21:02	0:09:59							
	MDR & MRT	ASF	52	20:50:30	21:03:10	0:12:40	20:50:43	21:03:09	0:12:26							
	MDR & MRT	ASF	56	22:30:29	22:42:48	0:12:19	22:30:42	22:42:47	0:12:05							
2	MDR & MRT	ASF	3	0:10:16	0:20:45	0:10:29	0:10:29	0:20:44	0:10:15							
	MDR & MRT	HEOC	7	2:01:27	2:12:28	0:11:01	2:01:40	2:12:27	0:10:47							
	MDR & MRT	WFF	11	3:13:05	3:25:17	0:12:12	3:13:18	3:25:16	0:11:58							
	MDR & MRT	ASF	15	5:04:37	5:16:06	0:11:29	5:04:50	5:16:05	0:11:15							
	MDR & MRT	ASF	19	6:43:17	6:56:02	0:12:45	6:43:30	6:56:01	0:12:31							
	MDR & MRT	ASF	23	8:24:02	8:35:57	0:11:55	8:24:15	8:35:56	0:11:41							
	MDR & MRT	KRNS	27	10:17:41	10:30:29	0:12:48	10:17:54	10:30:28	0:12:34							
	MDR & MRT	HEOC	31	11:40:17	11:50:49	0:10:32	11:40:30	11:50:48	0:10:18							
	MDR & MRT	HEOC	35	13:19:31	13:30:35	0:11:04	13:19:44	13:30:34	0:10:50							
	MDR & MRT	WFF	39	15:29:52	15:42:25	0:12:33	15:30:05	15:42:24	0:12:19							
	MDR & MRT	KRNS	43	16:53:52	17:05:08	0:11:17	16:54:05	17:05:07	0:11:03							
	MDR & MRT	WFF	43	17:11:09	17:20:13	0:09:04	17:11:22	17:20:12	0:08:50							
	MDR & MRT	KRNS	47	18:32:19	18:44:49	0:12:30	18:32:32	18:44:48	0:12:16							
	MDR & MRT	ASF	51	20:25:32	20:37:55	0:12:23	20:25:45	20:37:54	0:12:09							
	MDR & MRT	ASF	55	22:05:29	22:18:04	0:12:35	22:05:42	22:18:03	0:12:21							

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP		
				aos	los	aos-los	aos (aos+13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time
3	MDR & MRT	ASF	2	23:45:22	23:56:22	0:11:00	23:45:35	23:56:21	0:10:46							
	MDR & MRT	HEOC	6	1:36:21	1:48:26	0:12:05	1:36:34	1:48:25	0:11:51							
	MDR & MRT	WFF	10	2:48:05	3:00:22	0:12:17	2:48:18	3:00:21	0:12:03							
	MDR & MRT	ASF	14	4:40:09	4:51:10	0:11:01	4:40:22	4:51:09	0:10:47							
	MDR & MRT	ASF	18	6:18:27	6:31:02	0:12:35	6:18:40	6:31:01	0:12:21							
	MDR & MRT	ASF	22	7:58:37	8:11:00	0:12:23	7:58:50	8:10:59	0:12:09							
	MDR & MRT	KRNS	26	9:52:41	10:05:26	0:12:45	9:52:54	10:05:25	0:12:31							
	MDR & MRT	HEOC	30	11:16:29	11:25:11	0:08:42	11:16:42	11:25:10	0:08:28							
	MDR & MRT	HEOC	34	12:53:36	13:06:10	0:12:34	12:53:49	13:06:09	0:12:20							
	MDR & MRT	KRNS	38	14:51:10	15:01:30	0:08:24	14:51:23	15:01:29	0:10:07							
	MDR & MRT	WFF	38	15:05:11	15:17:01	0:11:50	15:05:24	15:17:00	0:11:36							
	MDR & MRT	WFF	42	16:45:25	16:56:22	0:10:57	16:45:38	16:56:21	0:10:43							
	MDR & MRT	KRNS	46	18:07:36	18:19:52	0:12:15	18:07:49	18:19:51	0:12:01							
	MDR & MRT	ASF	50	20:00:36	20:12:30	0:11:54	20:00:49	20:12:29	0:11:40							
	MDR & MRT	ASF	54	21:40:31	21:53:14	0:12:43	21:40:44	21:53:13	0:12:29							
4	MDR & MRT	ASF	1	23:20:26	23:31:55	0:11:29	23:20:39	23:31:54	0:11:15							
	MDR & MRT	HEOC	5	1:11:26	1:24:00	0:12:34	1:11:39	1:23:59	0:12:20							
	MDR & MRT	WFF	9	2:23:28	2:35:21	0:11:53	2:23:41	2:35:20	0:11:39							
	MDR & MRT	ASF	13	4:15:46	4:26:16	0:10:30	4:15:59	4:26:15	0:10:16							
	MDR & MRT	ASF	17	5:53:44	6:06:02	0:12:18	5:53:57	6:06:01	0:12:04							
	MDR & MRT	ASF	21	7:33:21	7:46:01	0:12:40	7:33:34	7:46:00	0:12:26							
	MDR & MRT	ASF	25	9:15:30	9:25:43	0:10:13	9:15:43	9:25:42	0:09:59							
	MDR & MRT	KRNS	29	11:07:40	11:20:16	0:12:36	11:07:53	11:20:15	0:12:22							
	MDR & MRT	HEOC	33	12:28:38	12:41:15	0:12:37	12:28:51	12:41:14	0:12:23							
	MDR & MRT	WFF	37	14:40:48	14:51:08	0:10:20	14:41:01	14:51:07	0:10:06							
	MDR & MRT	WFF	41	16:20:00	16:32:04	0:12:04	16:20:13	16:32:03	0:11:50							
	MDR & MRT	KRNS	45	17:42:58	17:54:55	0:11:57	17:43:11	17:54:54	0:11:43							
	MDR & MRT	ASF	49	19:35:41	19:46:53	0:11:12	19:35:54	19:46:52	0:10:58							
	MDR & MRT	ASF	53	21:15:31	21:28:17	0:12:46	21:15:44	21:28:16	0:12:32							
	MDR & MRT	ASF	57	22:55:29	23:07:24	0:11:55	22:55:42	23:07:23	0:11:41							

(2) Path Calendar

Operation		Date		Rev.													
		from Launch	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Instrument Checkout	AMSR C/O	34															
	ETO	44															
		45															
		46															
		47															
		48															
		49															
		50															
		51															
		52															
		56															
		57															
		58															
		60															
		61															
		63															
		64															
		65															
		67															
		68															
		70															

Appendix 5 MDR and GLI 250m Nominal Operation Pattern for GLI C/O

(1) MDR and GLI 250 Operation Pattern of 1 Recurrent Cycle (4 days)

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP			GLI 250m Data Transmissin Time		
				aos	los	aos-los	aos (aos+ 13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time	start	stop	Transmission time
1	GLI250 & MRT	HEOC	4	0:46:45	0:58:38	0:11:53	0:46:58	0:58:37	0:11:39										
	GLI250 & MRT	HEOC	8	2:26:47	2:36:17	0:09:30	2:27:00	2:36:16	0:09:16										
	MDR & MRT	KRNS	24	7:22:58	7:32:00	0:09:02	7:23:11	7:31:59	0:08:48										
	MDR & MRT	KRNS	28	10:42:41	10:55:27	0:12:46	10:42:54	10:55:26	0:12:32										
	MDR & MRT	HEOC	32	12:04:04	12:16:08	0:12:04	12:04:17	12:16:07	0:11:50										
	ODR(GLI250) & MRT	HEOC	36	13:46:10	13:54:39	0:08:29	13:46:23	13:54:38	0:08:15										
	MDR & MRT	KRNS	40	15:40:19	15:50:47	0:10:28	15:40:32	15:50:46	0:10:14										
	MDR & MRT	KRNS	44	17:18:23	17:30:00	0:11:36	17:18:36	17:29:59	0:11:22										
	MDR & MRT	KRNS	48	18:57:07	19:09:48	0:12:41	18:57:20	19:09:47	0:12:27										
	MDR & MRT	KRNS	52	20:37:22	20:49:48	0:12:26	20:37:35	20:49:47	0:12:12										
	MDR & MRT	ASF	56	22:30:29	22:42:48	0:12:19	22:30:42	22:42:47	0:12:05										
2	GLI250 & MRT	HEOC	3	0:22:23	0:32:48	0:10:25	0:22:36	0:32:47	0:10:11										
	GLI250 & MRT	HEOC	7	2:01:27	2:12:28	0:11:01	2:01:40	2:12:27	0:10:47										
	MDR & MRT	KRNS	23	8:37:42	8:49:28	0:11:46	8:37:55	8:49:27	0:11:32										
	MDR & MRT	KRNS	27	10:17:41	10:30:29	0:12:48	10:17:54	10:30:28	0:12:34										
	ODR(GLI250) & MRT	HEOC	31	11:40:17	11:50:49	0:10:32	11:40:30	11:50:48	0:10:18										
	MDR & MRT	HEOC	35	13:19:31	13:30:35	0:11:04	13:19:44	13:30:34	0:10:50										
	MDR & MRT	KRNS	39	15:15:45	15:26:07	0:10:21	15:15:58	15:26:06	0:10:07										
	MDR & MRT	KRNS	43	16:53:52	17:05:08	0:11:17	16:54:05	17:05:07	0:11:03										
	MDR & MRT	KRNS	47	18:32:19	18:44:49	0:12:30	18:32:32	18:44:48	0:12:16										
	MDR & MRT	KRNS	51	20:12:07	20:24:48	0:12:41	20:12:20	20:24:47	0:12:27										
	MDR & MRT	ASF	55	22:05:29	22:18:04	0:12:35	22:05:42	22:18:03	0:12:21										

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP			GLI 250m Data Transmissin Time		
				aos	los	aos-los	aos (aos+ 13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time	start	stop	Transmission time
3	GLI250 & MRT	HEOC	2	23:58:37	0:05:35	0:06:58	23:58:50	0:05:34	0:06:44										
	GLI250 & MRT	HEOC	6	1:36:21	1:48:26	0:12:05	1:36:34	1:48:25	0:11:51										
	MDR & MRT	KRNS	22	8:12:45	8:23:50	0:11:06	8:12:58	8:23:49	0:10:52										
	MDR & MRT	KRNS	26	9:52:41	10:05:26	0:12:45	9:52:54	10:05:25	0:12:31										
	ODR(GLI250) & MRT	HEOC	30	11:16:29	11:25:11	0:08:42	11:16:42	11:25:10	0:08:28										
	MDR & MRT	HEOC	34	12:53:36	13:06:10	0:12:34	12:53:49	13:06:09	0:12:20										
	MDR & MRT	KRNS	38	14:51:10	15:01:30	0:10:21	14:51:23	15:01:29	0:10:07										
	MDR & MRT	KRNS	42	16:29:21	16:40:18	0:10:58	16:29:34	16:40:17	0:10:44										
	MDR & MRT	KRNS	46	18:07:36	18:19:52	0:12:15	18:07:49	18:19:51	0:12:01										
	MDR & MRT	KRNS	50	19:47:01	19:59:48	0:12:47	19:47:14	19:59:47	0:12:33										
	MDR & MRT	ASF	54	21:40:31	21:53:14	0:12:43	21:40:44	21:53:13	0:12:29										
4	GLI250 & MRT	HEOC	5	1:11:26	1:24:00	0:12:34	1:11:39	1:23:59	0:12:20										
	GLI250 & MRT	HEOC	9	2:52:23	3:00:24	0:08:01	2:52:36	3:00:23	0:07:47										
	MDR & MRT	KRNS	25	9:27:41	9:40:15	0:12:34	9:27:54	9:40:14	0:12:20										
	MDR & MRT	KRNS	29	11:07:40	11:20:16	0:12:36	11:07:53	11:20:15	0:12:22										
	MDR & MRT	HEOC	33	12:28:38	12:41:15	0:12:37	12:28:51	12:41:14	0:12:23										
	ODR(GLI250) & MRT	HEOC	37	14:13:18	14:18:28	0:05:10	14:13:31	14:18:27	0:04:56										
	MDR & MRT	KRNS	41	16:04:50	16:15:31	0:10:41	16:05:03	16:15:30	0:10:27										
	MDR & MRT	KRNS	45	17:42:58	17:54:55	0:11:57	17:43:11	17:54:54	0:11:43										
	MDR & MRT	KRNS	49	19:22:01	19:34:47	0:12:47	19:22:14	19:34:46	0:12:33										
	MDR & MRT	KRNS	53	21:02:46	21:14:48	0:12:02	21:02:59	21:14:47	0:11:48										
	MDR & MRT	ASF	57	22:55:29	23:07:24	0:11:55	22:55:42	23:07:23	0:11:41										

(2) Path Calendar

Operation	Date		Rev.												
	from Launch	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GLI Checkout	53															
	54															
	55															

Appendix 6 MDR & GLI 250m Nominal Operation Pattern for Sys-1

(1) MDR & GLI 250m Operation Pattern of 1 Recurrent Cycle (4 days)

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP			GLI 250m Data Transmissin Time		
				aos	los	aos-los	aos (aos +13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time	start	stop	Transmission time
1	MRT	ASF	4	0:35:41	0:45:40	0:09:59	0:35:54	0:45:39	0:09:45										
	MDR & MRT	HEOC	4	0:47:19	0:59:12	0:11:53	0:47:32	0:59:11	0:11:39										
	MDR & MRT	WFF	8	1:59:46	2:10:42	0:10:56	1:59:59	2:10:41	0:10:42										
	MRT	ASF	8	2:14:22	2:23:16	0:08:54	2:14:35	2:23:15	0:08:40										
	MDR & MRT	HEOC	8	2:27:21	2:36:51	0:09:30	2:27:34	2:36:50	0:09:16										
	MDR & MRT	ASF	12	3:51:58	4:01:59	0:10:01	3:52:11	4:01:58	0:09:47										
	MDR & MRT	ASF	16	5:29:41	5:41:37	0:11:56	5:29:54	5:41:36	0:11:42										
	MDR & MRT	ASF	20	7:08:49	7:21:35	0:12:46	7:09:02	7:21:34	0:12:32										
	MDR & MRT	ASF	24	8:50:13	9:01:25	0:11:12	8:50:26	9:01:24	0:10:58										
	GLI250 & MRT	KRNS	24	9:03:14	9:15:28	0:12:14	9:03:27	9:15:27	0:12:00										
	MRT	ASF	28	10:35:49	10:39:36	0:03:47	10:36:02	10:39:35	0:03:33										
	MDR & MRT	KRNS	28	10:43:15	10:55:59	0:12:44	10:43:28	10:55:58	0:12:30										
	MDR & MRT	HEOC	32	12:04:38	12:16:42	0:12:04	12:04:51	12:16:41	0:11:50										
	GLI250 & MRT	KRNS	32	12:23:05	12:34:50	0:11:45	12:23:18	12:34:49	0:11:31										
	MDR & MRT	HEOC	36	13:45:19	13:55:23	0:10:04	13:45:32	13:55:22	0:09:50										
	MRT	KRNS	36	14:02:23	14:12:53	0:10:30	14:02:36	14:12:52	0:10:16										
	MDR & MRT	WFF	36	14:17:33	14:25:06	0:07:33	14:17:46	14:25:05	0:07:19										
	MDR & MRT	WFF	40	15:55:20	16:07:59	0:12:39	15:55:33	16:07:58	0:12:25										
	MDR & MRT	KRNS	44	17:18:57	17:30:32	0:11:35	17:19:10	17:30:31	0:11:21										
	MDR & MRT	KRNS	48	18:57:40	19:10:20	0:12:40	18:57:53	19:10:19	0:12:26										
	GLI250 & MRT	ASF	48	19:11:23	19:21:36	0:10:13	19:11:36	19:21:35	0:09:59										
	MDR & MRT	ASF	52	20:51:04	21:03:44	0:12:40	20:51:17	21:03:43	0:12:26										
	MDR & MRT	ASF	56	22:31:03	22:43:22	0:12:19	22:31:16	22:43:21	0:12:05										
2	MDR & MRT	ASF	3	0:10:50	0:21:19	0:10:29	0:11:03	0:21:18	0:10:15										
	GLI250 & MRT	HEOC	3	0:22:57	0:33:22	0:10:25	0:23:10	0:33:21	0:10:11										
	MDR & MRT	WFF	7	1:35:57	1:45:23	0:09:26	1:36:10	1:45:22	0:09:12										
	MRT	ASF	7	1:49:49	1:58:47	0:08:58	1:50:02	1:58:46	0:08:44										
	MDR & MRT	HEOC	7	2:02:00	2:13:01	0:11:01	2:02:13	2:13:00	0:10:47										
	MDR & MRT	ASF	11	3:27:38	3:37:11	0:09:33	3:27:51	3:37:10	0:09:19										
	MDR & MRT	ASF	15	5:05:10	5:16:39	0:11:29	5:05:23	5:16:38	0:11:15										
	MDR & MRT	ASF	19	6:43:51	6:56:36	0:12:45	6:44:04	6:56:35	0:12:31										
	MDR & MRT	ASF	23	8:24:36	8:36:31	0:11:55	8:24:49	8:36:30	0:11:41										
	GLI250 & MRT	KRNS	23	8:38:16	8:50:01	0:11:45	8:38:29	8:50:00	0:11:31										
	MRT	ASF	27	10:08:37	10:15:35	0:06:58	10:08:50	10:15:34	0:06:44										
	MDR & MRT	KRNS	27	10:18:14	10:31:02	0:12:48	10:18:27	10:31:01	0:12:34										
	MDR & MRT	HEOC	31	11:40:50	11:51:22	0:10:32	11:41:03	11:51:21	0:10:18										
	MDR & MRT	KRNS	31	11:58:09	12:10:14	0:12:05	11:58:22	12:10:13	0:11:51										
	MDR & MRT	HEOC	35	13:20:04	13:31:08	0:11:04	13:20:17	13:31:07	0:10:50										
	MRT	KRNS	35	13:37:37	13:48:25	0:10:48	13:37:50	13:48:24	0:10:34										
	MDR & MRT	WFF	39	15:30:25	15:42:58	0:12:33	15:30:38	15:42:57	0:12:19										
	MDR & MRT	KRNS	43	16:54:25	17:05:40	0:11:15	16:54:38	17:05:39	0:11:01										
	GLI250 & MRT	WFF	43	17:11:42	17:20:46	0:09:04	17:11:55	17:20:45	0:08:50										
	MDR & MRT	KRNS	47	18:32:53	18:45:22	0:12:29	18:33:06	18:45:21	0:12:15										
	GLI250 & MRT	ASF	47	18:46:38	18:55:31	0:08:53	18:46:51	18:55:30	0:08:39										
	MDR & MRT	ASF	51	20:26:06	20:38:29	0:12:23	20:26:19	20:38:28	0:12:09										
	MDR & MRT	ASF	55	22:06:03	22:18:38	0:12:35	22:06:16	22:18:37	0:12:21										

Recurrent Day	Data	Station	path	Visible information			Downlink information			MDR REC				MDR REP			GLI 250m Data Transmissin Time		
				aos	los	aos-los	aos (aos +13s)	los (los-1s)	aos-los	start	stop	rec time [min]	Interval (Rec stop >> Rep start)	start	stop	rep time	start	stop	Transmission time
3	MDR & MRT	ASF	2	23:45:55	23:56:55	0:11:00	23:46:08	23:56:54	0:10:46										
	MRT	HEOC	2	23:59:10	0:06:08	0:06:58	23:59:23	0:06:07	0:06:44										
	MRT	ASF	6	1:25:11	1:34:23	0:09:12	1:25:24	1:34:22	0:08:58										
	MDR & MRT	HEOC	6	1:36:54	1:48:59	0:12:05	1:37:07	1:48:58	0:11:51										
	MDR & MRT	WFF	10	2:48:38	3:00:55	0:12:17	2:48:51	3:00:54	0:12:03										
	MRT	ASF	10	3:03:15	3:12:27	0:09:12	3:03:28	3:12:26	0:08:58										
	MRT	HEOC	10	3:20:09	3:25:02	0:04:53	3:20:22	3:25:01	0:04:39										
	MDR & MRT	ASF	14	4:40:43	4:51:44	0:11:01	4:40:56	4:51:43	0:10:47										
	MDR & MRT	ASF	18	6:19:01	6:31:36	0:12:35	6:19:14	6:31:35	0:12:21										
	MDR & MRT	ASF	22	7:59:11	8:11:34	0:12:23	7:59:24	8:11:33	0:12:09										
	GLI250 & MRT	KRNS	22	8:13:18	8:24:23	0:11:05	8:13:31	8:24:22	0:10:51										
	MDR & MRT	ASF	26	9:42:09	9:51:01	0:08:52	9:42:22	9:51:00	0:08:38										
	GLI250 & MRT	KRNS	26	9:53:14	10:05:54	0:12:40	9:53:27	10:05:53	0:12:26										
	MDR & MRT	HEOC	30	11:17:02	11:25:44	0:08:42	11:17:15	11:25:43	0:08:28										
	MDR & MRT	KRNS	30	11:33:12	11:45:33	0:12:21	11:33:25	11:45:32	0:12:07										
	MRT	HEOC	34	12:54:09	13:06:43	0:12:34	12:54:22	13:06:42	0:12:20										
	MDR & MRT	KRNS	34	13:12:49	13:23:54	0:11:05	13:13:02	13:23:53	0:10:51										
	MRT	KRNS	38	14:51:44	15:01:54	0:10:10	14:51:57	15:01:53	0:09:56										
	MDR & MRT	WFF	38	15:05:45	15:17:35	0:11:50	15:05:58	15:17:34	0:11:36										
	MDR & MRT	WFF	42	16:45:59	16:56:56	0:10:57	16:46:12	16:56:55	0:10:43										
	MDR & MRT	KRNS	46	18:08:10	18:20:24	0:12:14	18:08:23	18:20:23	0:12:00										
	MRT	ASF	46	18:22:05	18:29:03	0:06:58	18:22:18	18:29:02	0:06:44										
	MDR & MRT	ASF	50	20:01:09	20:13:03	0:11:54	20:01:22	20:13:02	0:11:40										
	MDR & MRT	ASF	54	21:41:04	21:53:47	0:12:43	21:41:17	21:53:46	0:12:29										
4	MDR & MRT	ASF	1	23:20:59	23:32:28	0:11:29	23:21:12	23:32:27	0:11:15										
	MRT	ASF	5	1:00:27	1:10:00	0:09:33	1:00:40	1:09:59	0:09:19										
	MDR & MRT	HEOC	5	1:11:59	1:24:33	0:12:34	1:12:12	1:24:32	0:12:20										
	MDR & MRT	WFF	9	2:24:02	2:35:55	0:11:53	2:24:15	2:35:54	0:11:39										
	MRT	ASF	9	2:38:52	2:47:49	0:08:57	2:39:05	2:47:48	0:08:43										
	MDR & MRT	HEOC	9	2:53:57	3:02:06	0:08:09	2:54:10	3:02:05	0:07:55										
	MDR & MRT	ASF	13	4:16:20	4:26:50	0:10:30	4:16:33	4:26:49	0:10:16										
	MDR & MRT	ASF	17	5:54:18	6:06:36	0:12:18	5:54:31	6:06:35	0:12:04										
	MDR & MRT	ASF	21	7:33:54	7:46:34	0:12:40	7:34:07	7:46:33	0:12:26										
	GLI250 & MRT	KRNS	21	7:48:23	7:58:34	0:10:11	7:48:36	7:58:33	0:09:57										
	MRT	ASF	25	9:16:03	9:26:16	0:10:13	9:16:16	9:26:15	0:09:59										
	MDR & MRT	KRNS	25	9:28:14	9:40:45	0:12:31	9:28:27	9:40:44	0:12:17										
	MRT	HEOC	29	10:56:04	10:59:28	0:03:24	10:56:17	10:59:27	0:03:10										
	MDR & MRT	KRNS	29	11:08:13	11:20:48	0:12:35	11:08:26	11:20:47	0:12:21										
	MDR & MRT	HEOC	33	12:29:12	12:41:49	0:12:37	12:29:25	12:41:48	0:12:23										
	GLI250 & MRT	KRNS	33	12:47:58	12:59:24	0:11:26	12:48:11	12:59:23	0:11:12										
	MDR & MRT	HEOC	37	14:11:51	14:18:37	0:06:46	14:12:04	14:18:36	0:06:32										
	MRT	KRNS	37	14:27:05	14:37:22	0:10:17	14:27:18	14:37:21	0:10:03										
	MDR & MRT	WFF	37	14:41:22	14:51:42	0:10:20	14:41:35	14:51:41	0:10:06										
	MDR & MRT	WFF	41	16:20:34	16:32:38	0:12:04	16:20:47	16:32:37	0:11:50										
	MDR & MRT	KRNS	45	17:43:31	17:55:28	0:11:57	17:43:44	17:55:27	0:11:43										
	MRT	ASF	45	17:58:02	18:01:54	0:03:52	17:58:15	18:01:53	0:03:38										
	MDR & MRT	ASF	49	19:36:14	19:47:26	0:11:12	19:36:27	19:47:25	0:10:58										
	MDR & MRT	ASF	53	21:16:04	21:28:50	0:12:46	21:16:17	21:28:49	0:12:32										
	MDR & MRT	ASF	57	22:56:03	23:07:58	0:11:55	22:56:16	23:07:57	0:11:41										

(2) Path Calendar

Operation	Date		Rev.												
	from Launch	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Sys-1	99															
	100															
	101															
	102															